NINETY-EIGHTH YEAR

AMERICAN Gas Journal

3 - JAN 22 1957
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DECEMBER, 1956

Only Magazine Published Exclusively for the Gas Utility Industry

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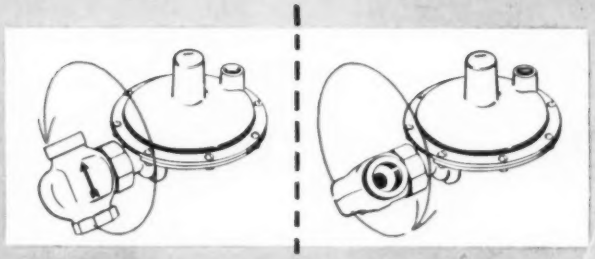

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12" diaphragm	ounces to 5 psi
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Good Everywhere

memo:

from the editors

Every year about this time, since 1922, the editors of AGJ begin unraveling themselves from the rigorous task of putting out two issues in one month — a regular monthly issue and the mid-November issue — AGJ's *Handbook Issue*. Quite a few cubic feet of gas are burned in the old midnight gas light as the final touches are put on the big handbook issue. Each year all of the data in the handbook is carefully reviewed and that data requiring revision, or updating, receives special attention.

Revising such data is a cooperative venture between the editors and top authorities in the industry. These authorities are selected and asked to assist in making the revisions. The 1956 Handbook is no exception — with over 50 per cent of it revised — and with some 40 gas utility men "helping out."

Every subscriber to AMERICAN GAS JOURNAL receives a copy. If you haven't given your copy careful scrutiny to see "what's new," now is the time to do so.

You'll discover why it is called the only contemporary source of gas utility industry engineering and operating data — available in one single handbook.

Big things are ahead for 1957 in AGJ! In January we'll have our annual "Outlook" with reports from all branches of the industry on both the future and the immediate past.

News about our series of articles on "Communication" by Dennis Murphy. The final article (No. 12) appears in this issue. And in answer to the multitude of requests for reprints that have been pouring in to this office . . . they are now available. You can get a complete reprint with a **new** or **renewal** subscription to American Gas Journal. **The reprints will not be sold separately.** The supply is limited, so act now — and be sure to tell the fellow at the next desk to get his own copy!

The Holiday Season is upon us . . . coupled with the winter and weather that sells gas. We hope all our friends find time between "peaks" to enjoy themselves, and from all of us at American Gas Journal, here's wishing you a . . .

Merry Christmas and a Happy New Year! — *The Editors*

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AMERICAN **Gas Journal** NINETY-EIGHTH YEAR

GAS TECHNOLOGY — OPERATIONS — EQUIPMENT — MANAGEMENT — UTILIZATION

VOLUME 183 DECEMBER, 1956 NUMBER 13

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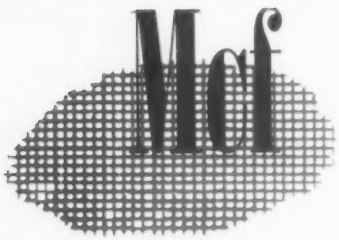

More than 50,000 basic models of gas appliances and accessories have been examined for compliance with American Standards for acceptability from the standpoints of safety and performance. An estimated 95 per cent of all gas appliances available on the market have been tested by AGA Laboratories and display the registered "Blue Star" seal of approval, C. S. Stackpole, AGA's managing director, told the recent Seventh National Conference on Standards meeting in New York City.

Directors of Pacific Northwest Pipeline Corporation and El Paso Natural Gas Company have signed an agreement that would provide for acquisition of the new Pacific Northwest pipe line by El Paso by an exchange of common stock shares. A special stockholders meeting has been called by El Paso Natural directors for December 21, 1956, to authorize the necessary shares to be used in the exchange.

Dollar volume of construction contract awards in 1957 will set a new record seven per cent above this year's total, estimates the F. W. Dodge Corporation, construction news and marketing specialists. Physical volume will not rise as rapidly as dollar volume, because of rising construction costs, the firm noted. There will be more commercial and industrial building, probably less residential, the outlook notes.

Nebraska's Railway Commission has assumed jurisdiction over rates and service of a natural gas company in a precedent setting decision handed down in early November. The commission, by a 2-1 vote, said it has jurisdiction over North Central Gas Company in a dispute involving the city of Bayard *(see Mcf, October, 1956, American Gas Journal)*. The company is expected to appeal to the state supreme court. The company says it is not a common carrier of natural gas since it does not charge for transporting its own gas via its own lines. The commission has jurisdiction over intrastate common carriers.

As is becoming customary in its legal relations with the natural gas industry, the U. S. Supreme Court has taken another negative action in refusing to review a lower court case. The latest case involves Panhandle Eastern Pipe Line Company and the FPC in a dispute over whether FPC attempts to regulate priority of transportation of gas via a pipe line between direct industrial customers and utility customers (for resale) was beyond the commission's statutory authority. The FPC can fix rates only for gas to be resold to ultimate consumers. It cannot fix rates or otherwise regulate direct industrial sales. FPC refused to permit Panhandle to transport gas needed to carry out proposed interruptible sales to industrial customers, and the FPC contended that the company was attempting to "skim off the cream of the volume business" by using most of its interruptible capacity for direct sales at higher prices. A lower court ruling upheld the FPC contention, and the decision now stands with higher court refusal to review the case.

Columbia Gas System is going into the petrochemical business. The vast gas system firm has reached an agreement with Commercial Solvents Corporation to conduct engineering and economic studies of a proposed joint project to be located in the Ohio Valley area. The 40 to 50 million dollar project is tentatively scheduled for construction in early 1957 after necessary regulatory authorizations have been obtained. Columbia's substantial gas reserves in the Appalachian area would provide the hydrocarbons to be utilized, and Commercial Solvents would supply the necessary technological and chemical marketing experience.

Philco Corporation has completed arrangements to sell, advertise, merchandise, and service Bendix Home Laundry equipment through its national distribution organization. It marks Philco's first entry into the gas appliance industry, and Philco executives have assured the gas utility industry that they will continue the policy recently instituted by Bendix to sell gas dryers and gas "Duomatics" at levels comparable to the electric models. AVCO Manufacturing Corporation, parent company of Bendix Home Appliances, recently announced that it was getting out of the appliance business.

Gas appliance sales will reach a fantastic total of 300,000,000 units between 1956 and 1975, three times the number currently in use, predicts the AGA's Bureau of Statistics, on the basis of a new long-range study of the gas utility industry's rapidly expanding potential. Predictions are for some 94,000,000 gas ranges; 80,000,000 gas water heaters; 25,000,000 central heating units; 20,000,000 floor and wall furnaces; 54,000,000 space heaters; 17,000,000 gas clothes dryers, and some 5,000,000 incinerators. Built-in appliances will become so common, say AGA prognosticators, that the only free-standing equipment in the kitchen of the future will be the housewife.

Applications have been hot and heavy in Georgia for certificates to serve areas of the state with natural gas, the result of an act by the 1956 state legislature requiring a certificate of convenience and necessity from the state public service commission for all pipe lines in the state. Even existing companies must have certificates, and the commission has adopted a rule that all applications must have a hearing. At least five gas companies and six municipalities have filed applications, and some 24 areas of possible conflict have been reported.

The FPC has resumed study of a rate case that led to the Supreme Court's decision to put independent producers under the thumb of government regulation. Hearings have been reopened on the natural gas rates charged by Phillips Petroleum Company as to whether or not they are reasonable and proper. The case began in 1948.

In Idaho, the state's supreme court has ruled that a franchise granted last March to the Idaho Falls Cooperative Association was illegal, void, and of no effect. The court said the formation of the cooperative and issuance of the franchise was "part of a plan and design to enable the city of Idaho Falls to evade and circumvent" the state's laws and constitution. The court noted that the co-ops were essentially public utilities, and subject to PUC jurisdiction. Intermountain Gas Company holds PUC permits to serve 17 communities, many of which have similar co-op set-ups.

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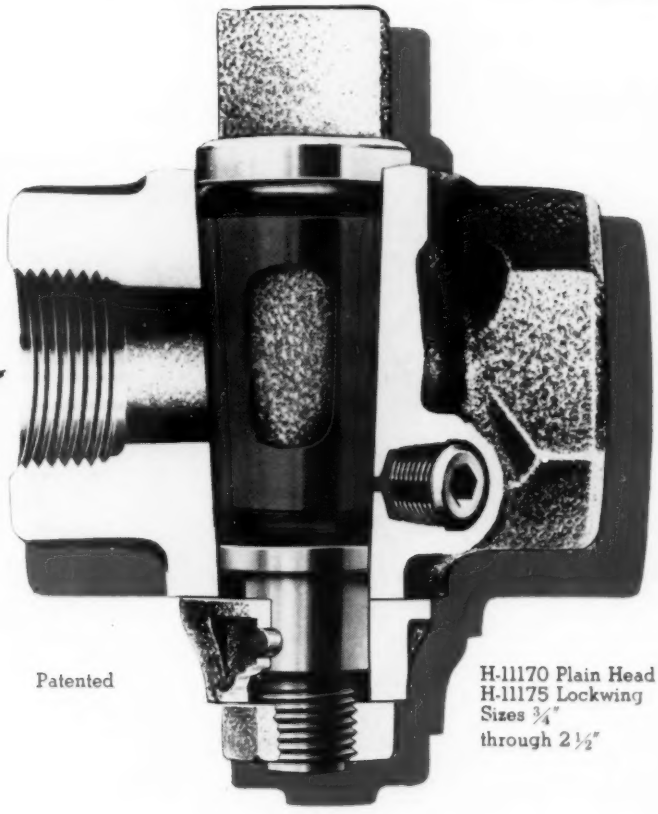

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rill. Mount "E-4" machine on control chamber. ll into main, retract boring bar and close ve in control chamber. Remove machine.

STEP 3
Plug. Attach insertion tool with completion plug, stem and bushing or valve stem, depending on tee used, to boring bar. Remount machine, open valve and insert.

STEP 4
Complete. Remove machine and control chamber. Install completion cap for a double seal. Test. Connection is now complete.

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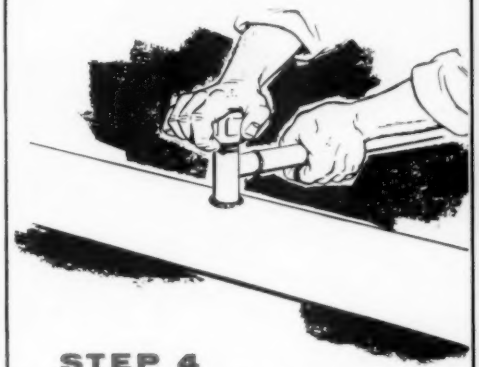

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For details write The Gas Equipment Manufacturers Committee, c/o GAMA, 60 East 42nd Street, New York 17, N.Y.

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"Our salesmen who call on superintendents of distribution report innumerable cases of highly enthusiastic comment. The personal gratitude towards us for supporting this program is almost embarrassing in its intensity. We have two problems—to sell our products to the industry and to sell the industry to the public. This program is a wonderful example of the American way of doing business."— ***K. G. Merrill, President M. B. Skinner Co.***

"We have received many complimentary reports from gas company officials and feel confident that the program has beneficially affected our business relations with our customers."— ***W. G. Hamilton, Jr. President, American Meter Co.***

"The many compliments we have received from our customers indicate that we are building a reservoir of good will. Comments made by many of our friends outside the industry indicate that the program has a strong consumer impact. What helps the industry helps us."— ***F. L. Fairchild, President, Sprague Meter Co.***

"Our continued support is ample proof of our belief in the GEM program's ability to reach the right people. Laudatory comments received from our customers convince us the program is doing us an inestimable amount of good."— ***J. A. Penote, Vice President, Cleveland Trencher Co.***

"We are confident of the success of the program and hope to justify further contributions toward its growth."— ***E. C. Hemes, Vice President, Vulcan Rubber Products Inc. Division of Reeves Brothers, Inc.***

"Our participation in this program has been beneficial to our company. It has created a very favorable climate and should benefit us in the long run."— ***Carl N. Brown, Sales Manager, Pipe, United States Pipe and Foundry Co.***

"We are certainly most happy to have had the privilege to participate in this program and will continue to do so."— ***T. J. Moore, A. C. Lawrence Leather Co.***

Published as a Service to the Gas Industry by

ROCKWELL MANUFACTURING COMPANY

Pittsburgh 8, Pa.

Inventory Control Plan SAVES $2,000,000

Excessive inventory reduced in two-year period by use of card control program at Lone Star Gas

Alex L. Acheson
Lone Star Gas Company, Dallas, Texas

In warehouse at Dallas G. R. Moon fills stock order for condulets. The bins are marked with the material's class and code number.

OVER a period of less than three years, Lone Star Gas Company has sliced approximately $2,000,000 from an excessive $8,000,000 "A" and "B" inventory for all classes of material by using a stock control plan.

The plan will continue in operation to reduce the inventory value to around $4,500,000 and maintain it at that level. This tentative figure was established by studies as the satisfactory amount for Lone Star's operations under existing conditions.

The purchasing and stores departments of Lone Star Gas Company and its wholly-owned subsidiary, Lone Star Producing Company, are responsible for the stock control plan's initiation and function.

Briefly, the problem facing Lone Star in January, 1954, was this: **Over a period of years, surpluses of many classes of material accumulated in the utility's various warehouses. This was due mainly to not planning an inventory to adequately care for normal operating requirements and purchasing additional material without first checking its availability in some other warehouse.**

Lone Star's management decided that the nearly $8,000,000 inventory held by both companies could be reduced. Ben R. Newbery, director of purchases and materials, undertook the task. Working with him were E. L. Harpold, supervisor, and A. L. Williams, assistant supervisor of stores.

Possible Solutions Studied

Five studies were evolved to handle the work.

They were:

(1) What inventory is necessary to adequately care for operating requirements in normal times?

(2) What amount of surplus exists?

(3) How to dispose of this surplus?

(4) How to maintain normal operating stocks in the future without developing surplus inventories?

(5) To determine what materials are not usable due to condition or obsolescence.

The latter two studies are still in operation and will be discussed later.

Due to the availability of materials, a 60-day stock lead period was established for normal operating requirements. Estimates from the field were requested on this basis for maintenance, repair and operating (MRO) materials.

Within two months the inventory forms showing quantity on hand, quantity used in past 60 days and quantity requested as a maximum stock were tabulated. The total for estimated MRO material needs came to about $4,500,000.

It was noted that estimates for many classes of maximum stock materials included in this figure were too high.

Reducing Inventories

Here are a few examples of how the administrators of the stock control plan felt that these estimates of *authorized maximum stock* could be reduced:

Many warehouses were carrying two or three different weights and grades of the same size line pipe in their AMS. This was unnecessary and was changed in many cases. Lone Star maintains central storage yards in four cities where requisitions for both plain end and screw line pipe can be filled.

An overabundance of screw and

J. B. Lucas checks a surplus report from the field against the Kardex file in the surplus section of the stores department. Material is posted in the Kardex according to classification, alphabetical listing and size.

Cecil Young, supervisor of the surplus section, takes an emergency phone order for material. This order, called a Phone-o-Gram, is first checked against the Kardex file to determine whether the material requested is available in another warehouse. If not, the order is passed on to the purchasing department.

welding fittings was found to exist. Since local jobbers carry such items (caps, ells, flanges, and swedges), it was decided to let them act as the warehouse with the company's warehouse carrying a 15-day supply only.

Results from these steps and others were encouraging. As of January 1, 1954, surplus material on hand after the authorized maximum stock step was taken was valued at approximately $3,500,000. By January 1, 1956, this figure had been reduced to about $1,500,000.

Accounting for a large part of this reduction, also, is the work being done by the surplus section of the purchasing and stores departments.

This section is responsible for handling material in the most logical manner — by using it within the two companies.

Reports Are Necessary

Storekeepers in the field furnish the section with monthly surplus material reports. The surplus section, under supervision of Cecil L. Young, compiles this information on approximately 10,000 accounts, keeping it in eight Kardex files.

Material is posted in the Kardex according to: First, classification; then by alphabetical order and size.

As of February, 1956, records in the Kardex were correct according to classification, etc. In about two years, another report, aside from the monthly ones, will be sent in from the field. By doing this, information will be current and the chance for human error in reporting greatly reduced.

Surplus material reports cover all items above a warehouse's authorized maximum stock. The surplus section personnel enter the forms in the Kardex.

All requisitions for stock go through this section. When one is received it is checked against the Kardex. If no surplus is available in any warehouse, then the requisition is passed to the purchasing department for buying.

Should a surplus exist, a material transfer order is issued to the warehouse holding the needed stock in its surplus. The stock is then delivered to the point requiring the material.

Substitutions

Storekeepers also are urged to substitute material on hand in their warehouse for requisitioned items provided they are like material and will do the job. For this reason, a correct description of all stock is necessary for the Kardex.

Another factor is that surplus material becomes dormant for either of two reasons: **Dormant due to a change in operating conditions, or dormant due to reluctance to substitute because of newer design.**

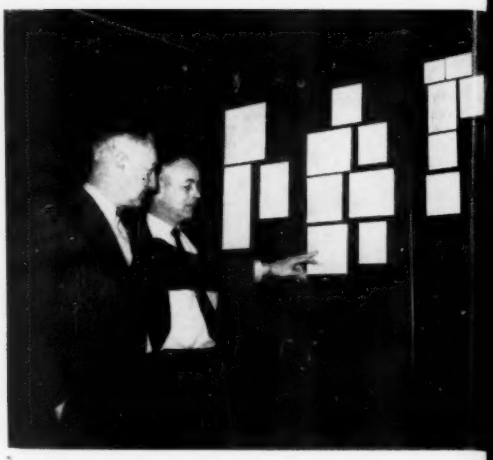
Lone Star's operating departments carefully check material declared dormant. If it is usable in any way, such as short sections of pipe that can be welded into longer sections, then it is returned to stock. Non-usable material is written off as junk and usually sold as such.

Another function of the surplus section is to take all emergency phone requisitions. Here, too, a check is made against the Kardex before any action is taken by the purchasing department.

Realization of study number four is being accomplished in two ways: Securing estimated quarterly requirements on major items such as casing, tubing, and line pipe from the operating departments, and controlling quantities of other stock material by limiting each warehouse to a 60-day supply of maintenance, repair, and operating material.

In order to keep the plan operating efficiently and to reach the ultimate goal of balancing authorized maximum stock with inventory value, supervisory personnel from the purchasing and stores departments hold annual meetings with the storekeepers in the field. This gives both groups a chance to discuss new ideas and air problems which arise during the year. * * *

Proper use of all equipment is stressed in training classes conducted for both new and old employees. Both lecture and laboratory classes are used in the training program.



Nelson LeClair, Jr., assistant manager of I-IG&E's gas department, left, points to one of several equipment lists posted in company's tool room where crews may draw equipment for special jobs. Looking on is Ken Tohill, Mueller Company representative.

Iowa-Illinois Gas & Electric uses well balanced program of training, standard methods and standardized tools to increase manpower production

Four-Point Program Pays Dividends in Service Program

A four-point program that has established and maintained desired production standards is paying handsome dividends for the gas department of Iowa-Illinois Gas and Electric Company.

The plan is highlighted by an initial training program that leads a new employee from apprentice to journeyman by means of a thorough three-year company school.

Establishment of this overall program makes it possible for the Davenport, Iowa, utility to set, measure, and evaluate the production of each crew, determining man-hours required for similar jobs. This information has resulted in operational economics and safer methods.

The program, devised by Robert Hetherington, gas department manager, and his staff, includes these four steps:

1. Establishment of construction and maintenance methods with standard drawings covering those methods.
2. Establishment of the proper types and quantities of tools and equipment to efficiently and safely perform the various operations.
3. Procurement and distribution of tools and equipment, and establishment of a system for their control and maintenance.
4. Establishment of an initial training program that includes a review course for all journeymen, third and second year apprentices, and a full course in applicable subjects for the latter two and first year apprentices.

Before the educational program was launched, it was realized that the average new employee was not familiar with problems presented while working on gas mains and with gas equipment. What's more, it was felt that many of the company's veteran employees possibly were unfamiliar with the correct use of some equipment, especially the latest developments offered by such firms as Mueller Company.

Need Was Apparent

It became apparent that a training program would be necessary if Iowa-Illinois Gas and Electric Company was to provide the best possible service to its customers in a safe and economical manner. For this reason, the four-point program was developed.

It is interesting to study further the components of each of the four steps.

The first step concerns the establishment of construction and maintenance methods with standard drawings covering these methods. It was determined what fittings should be used on each particular job and a complete set of drawings was made covering each operation. This enabled the apprentices to actually "see" the fitting as they studied its proper use in the gas system. New men also are taught the difference between low, intermediate, and high pressure services and that the type of pipe would determine the proper fittings required in each instance.

Step two ties in closely with the opening phase of the program. In order to establish the proper types and quantities of tools and equipment to efficiently and safely perform the various operations required of a gas crew, it is first necessary, as stated above, to determine what fittings will be used, thereby making it possible to determine what machines are required. At the same time, types of fittings dictate

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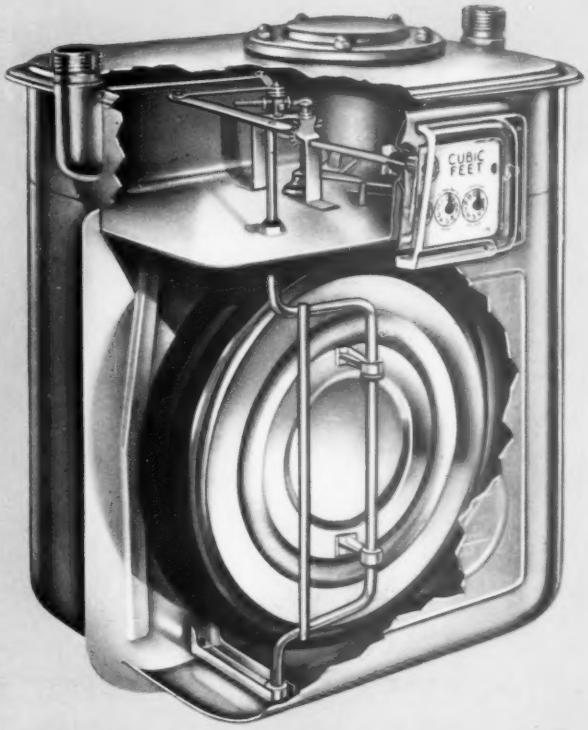

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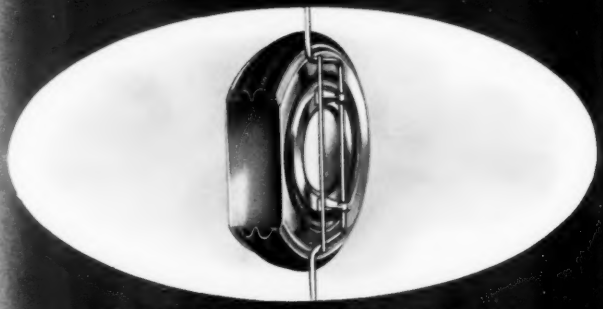

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Special equipment, such as this large drilling machine, (above) is kept in special storage cases, and stored on pipe racks in storeroom for easy access. **Clean and orderly** storeroom (right) assures easy, efficient handling of equipment and materials.

— Photos courtesy "Mueller Record"

to a large degree the type tools used.

From the standpoint of safety, the gas department naturally desired to do all work on gas mains under pressure without the blowing of gas. This led to the company's decision to adopt methods and standardize on equipment and line stopper fittings to accomplish this end.

The third step concerns the procurement and distribution of tools and equipment, and a system for their control and maintenance. Iowa-Illinois made it a policy to equip each crew truck with recommended standard machines, tools, and fittings. A master list of items for each truck was placed with equipment assigned to each crew. The equipment is generally suitable for handling all service work. These trucks have a tool chart showing what is included in each set of equipment. These are listed by tool numbers; they also give the specific fittings by size with which tools are used.

In addition to normal equipment placed on the truck, crews oftentimes are faced with jobs that call for equipment not supplied in each set. When this occurs, crews may draw from the tool room any equipment needed for a special job. Master lists are conveniently displayed in the tool room showing what is available.

How the Plan Works

A test case might be the following: A foreman instructs his crew to report to a particular area to perform a job. The men first check their truck set to determine if they have sufficient equipment to handle the task. Let's assume they are going to perform a two-inch stopping operation on steel pipe. Their regular set of equipment isn't sufficient to accomplish the assignment, so they report to the tool room and draw out a tapping machine, stopping machine, and necessary equipment.

The second part of step three—control and maintenance — is a matter of teaching employees the importance of properly caring for all equipment. Company officials found that by placing individual kits on each truck, men became more conscious of the equipment's appearance. A friendly rivalry among the crews has resulted in their efforts to keep their equipment in the best possible condition.

Training Program

Step four is the establishment of an initial training program that eventually leads each apprentice who successfully completes the program to the status of journeyman.

The first year mainman apprentice spends 40 hours in lecture and 16 hours in the laboratory for a total of 56 hours actual instruction. The course is divided into six phases covering these topics:

1. **Elements of Gas Business**
2. **Safety**
3. **Public Relations**
4. **Construction Tools — Maintenance and Care**
5. **Truck Operations and Care**
6. **Material**

Thorough examinations are given at the conclusion of each course and all apprentices must qualify with a successful grade before passing to the second year of training.

The second year apprentice course includes 43 hours of lecture and 30 hours in the laboratory or a total of 73 hours training. Subjects covered are the following:

1. **Construction Methods and Standards**
2. **Tapping equipment**
3. **Maintenance Methods and Standards**
4. **Appliances**
5. **Radio procedures**
6. **Equipment Operation and Care**

Examinations covering the second year's training must be passed before the apprentice may begin his third year of training. This third and final year of apprentice training consists of 42 hours lecture and 26 hours laboratory or 68 hours. These subjects are covered:

1. **Leak detection**
2. **Principles of Construction and Operation**
3. **Telemetering**
4. **Pipe Locators**
5. **Corrosion Mitigation**
6. **Tapping Equipment—Operation and Maintenance**
8. **Company Operation**
7. **Record Keeping**

Successful candidates become journeymen at the end of their year, and graduating employees of Iowa-Illinois Gas and Electric Company's Gas Department School are experts in their own right. They know gas equipment and how to use it.

The company has found another answer to an old problem — training crewmen in an organized and efficient manner to a point where they can safely handle the hazardous job of working on gas mains. While other gas companies have found equally efficient programs, this is the method favored by Iowa-Illinois Gas and Electric Company. The firm is to be commended for devising this training program.

Hot Sand: *One solution to problem of digging ditch in frozen ground for laying mains and services in the wintertime*

E. D. Marquesen
District Gas Engineer
Iowa Public Service Company, Waterloo, Iowa

EVERY winter the gas distribution department is faced with a major problem. How can gas mains and services be laid after the ground has frozen, without having construction costs too high to be offset by the winter revenue or too high to attract customer contributions toward construction costs?

One solution to this problem has met with more than moderate success in Waterloo, Iowa, by Iowa Public Service Company. This solution is offered to other gas companies with the hope that they can use it to advantage.

In early December, 1955, the frost line had reached a depth of over three feet in bare ground locations in Waterloo and vicinity. Orders were coming in daily to the Waterloo gas distribution department. The Shaffer Company, pipe line contractors, which had contracted for major portion of the company's new construction in 1955, had reached the point where its trenching machines were inoperative and the men were resorting to air tools to break out frost. One or two services were run by burning corn cobs over the trench-line to melt the frost before the trench for the gas pipe was dug. A check indicated that frost construction costs were more than double normal costs, and a more economical solution was needed or construction would bog down.

During a conversation with C. H. "Jack" Shaffer, the writer, remembering that hot dry sand was available locally, suggested that he try spreading this material over the trench line to drive out the frost and using some cheap insulating cover such as asbestos felt or rock wool to keep the heat from dissipating the atmosphere.

It was felt at the time that, even if the price of material proved to be relatively high, it would be offset by the savings in labor since the whole job of spreading and covering could be done in a matter of minutes with one or two laborers. Shaffer liked the idea and worked out the details with his men and with the Waterloo gas distribution department.

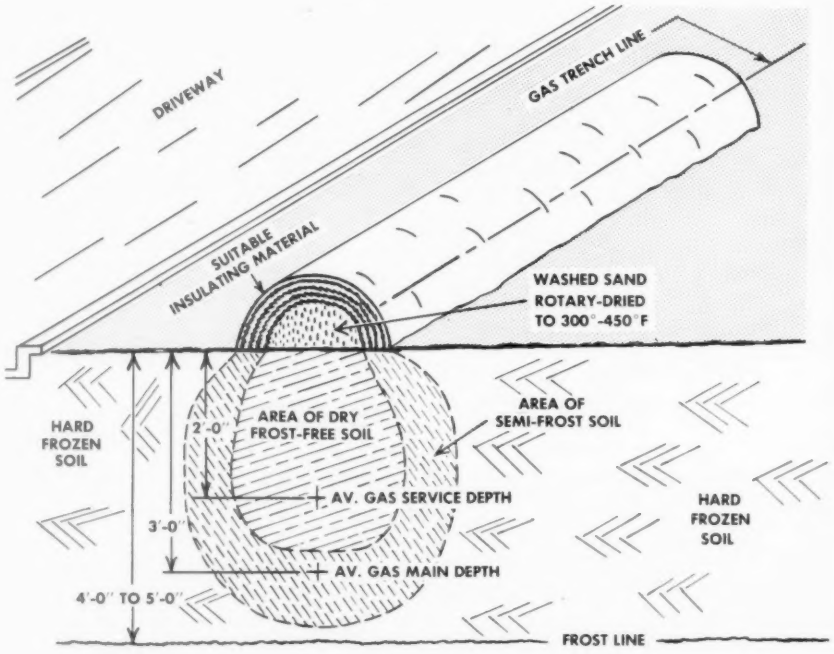


Diagram shows how "hot sand" method can be used to thaw out frozen soil.

Within a few days several services were dug after using the hot sand method. It was found that the frost was removed to a depth of 20-in. or more beneath the sand and the ground softened somewhat to a greater depth after the hot sand had been allowed to do its work for some 18 to 24 hours.

A ladder-type ditching machine could, with little difficulty, particularly in sand loam soil, ditch at nearly normal speeds. From that time (early December), until warmer weather, some 80 services totaling 5000 ft were run and some 450 ft of main installed. Customers made contributions to cover the overall added cost of winter construction, and everyone who wanted service and who would make a nominal con-

First step is to remove snow above trench line.

"Hot sand" is poured from truck over trench line.

Amount of sand used and depth of heat penetration depends on size and depth of ditch to be cut, and amount of insulation used. Sand must be "mounded up" over ditch area.

Layer of "cold sand" is applied above "hot sand" as insulation. Note steam rising where ground is thawing.

tribution based on actual cost was given installation.

What were these costs? Sand heated to 300-450 F cost about $2.50 per ton delivered. A load of seven tons will cover about 120 to 140 ft of trench line spread at the proper depth. With a spreading chute on the trucks, one skilled laborer can supervise the spreading.

Using another load of cold sand at approximately $1.35 per ton for insulation, instead of regular insulating materials, the entire process should add no more than 50 per cent of normal unit installation costs—if you have a company construction crew, or somewhat more if a contractor is doing the work. These added costs are, in most cases, assumed by customer contributions providing such costs remain within reason.

Naturally, some negative aspects have arisen. This method is not to be regarded as a panacea. In rocky soil, stones normally dislodged by a digging machine may hold fast in the lower frost strata. If these are encountered there is excessive wear and tear on machine bucket teeth.

Heat penetration is governed by the uniformity and the amount of the hot sand and insulation coverage. The 18 to 24 hours wait may be a disadvantage particularly if the weather turns too severe to work. These and other minor criticisms may rule out this method in certain locations.

It is felt that the method described and illustrated in this article may in its small way make possible new revenue sources for many companies by avoiding delay until spring of the laying of gas services applied for in the dead of winter by their customers. ★ ★ ★

Twelfth of a series

Communication:

Are We Using Our Powers of Observation?

Dennis Murphy

ONE of my fellow workers handed me a card the other day to "test my brains," as he put it. He asked me to read only one side of the card. It said:

> **FINISHED FIXTURES ARE RESULT OF YEARS OF SCIENTIFIC STUDY AND MANY YEARS OF EXPERIENCE**
>
> **Count the F's in this sentence. Count them only once. Don't go back to count again. How many F's do you find? See other side.**

The other side of the card read:

> **One of average intelligence finds three F's in the sentence. If you spotted four, you're above average. If you found five, you can turn up your nose at almost anybody. But if you caught six, you're a genius and too darned good to be wasting your time on foolishness like this.**

I found only five. "This is no test of brains," I said, looking down my nose at him; "it's a test of *observation*." But we should observe with our brain as well as with our eyes.

What Is Observation?

To have great powers of observation from birth is to be born to the purple, to move among the elect. We need to develop our five *senses* (feelings) as well as our *sense* (brain). One aim of education is to teach us to see, hear, smell, taste, and touch — in short, train us to observe. Too few people ever learn to observe or listen well, much less to smell or taste expertly — if we use *observe* in its broadest connotation. Most of us observe only well enough to "get by."

Observe means *see*. But Roget's *Thesaurus* also gives these synonyms:

look	watch	survey
view	gape	inspect
eye	ogle	perceive
peek	stare	discern
glance	leer	scrutinize
peep	glare	examine
glimpse	gaze	witness
notice	glower	detect
scan	gloat	regard
note	pore	contemplate

Dr. Murphy is administrative assistant, Service Pipe Line Company.

Some Laws of Nature

The *hunting animal* (like man, dog, cat, or monkey) has binocular vision. Its eyes, set in the front of its head, can be readily brought into focus on a single object, thus giving accuracy of vision.

In contrast, the *hunted animal* (like the deer, rabbit, mouse, or bird) has eyes on the sides of its head. This gives it a wider range of vision for detecting enemies, but less precision. Usually, it sees an object with only one eye and therefore lacks third-dimensional depth. Wild animals keep their observation at a razor-sharp edge. Life under domestication, however, dulls that edge. So, man has lost much of his keenness of sight, smell, and hearing — if not his "touch"!

Science Helps Man to Observe

Magnifying glasses, microscopes, telescopes, X-ray, and other optical instruments have helped man's powers of observation. Today over 25 per cent of our school-age children need glasses or eye treatment, and about 35 per cent of the 167 million people in our country wear glasses, according to statistics from the American Optical Company. Numerous others who need glasses get along without them.

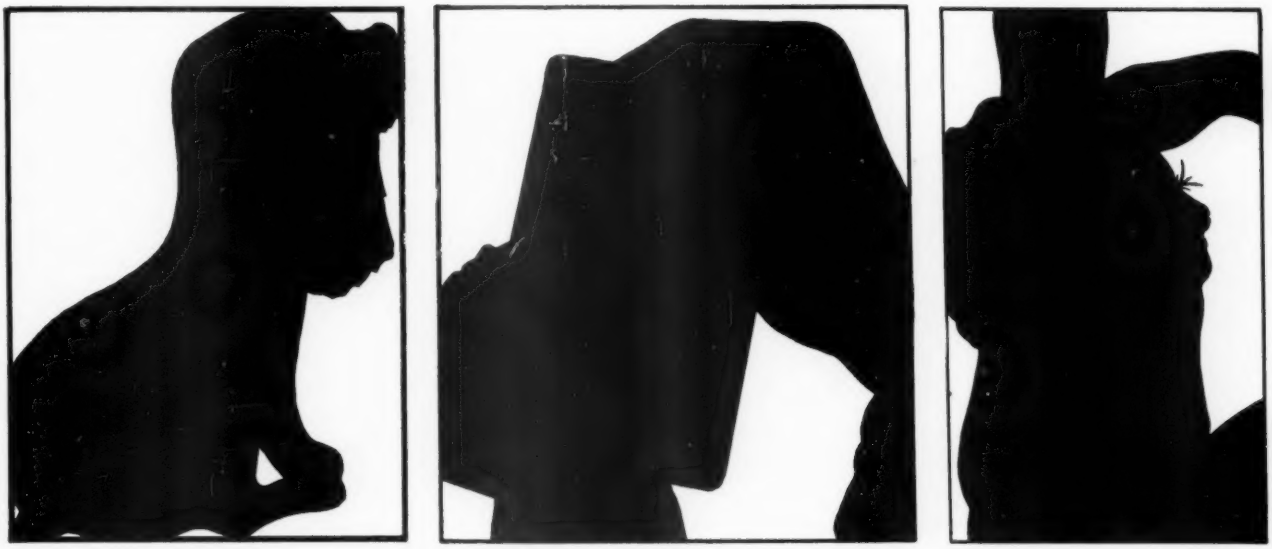
Many of us suffer from near-sightedness (myopia), far-sightedness (hyperopia), astigmatism, cataract, or glaucoma. Not to mention short-sightedness! An *ophthalmologist* (big word for *oculist*) is a medical doctor and often a trained surgeon who treats defects and diseases of the eye. He shouldn't be confused with an *optometrist*, who merely tests and examines the eyes to prescribe or sell eye-glasses. And an *optician* is a merchant or manufacturer, who makes and sells binoculars, lenses, and spectacles. Your grandpa called them "specks."

According to the Human Engineering Laboratories, about one per cent of all women and seven per cent of all men in our country are color-blind. Often they are blind to certain colors only; usually they can't tell the difference between reds, yellows, and greens. Yet many of them drive cars in city traffic by "location" of the lights! Incidentally, but not *too* incidentally, which color of the stoplight is at the top? the middle? the bottom? Are you sure?

Can Observation Be Cultivated?

"Most people have remarkably poor powers of observation," says Dr. Bruno Furst in his *Practical Way to a Better Memory*. But observing is communication skill, and you have to train yourself to observe more accurately and completely. How?

1. Develop your five senses to increase your *perception*.
2. Cultivate your *memory* of unusual characteristics.
3. Take extraordinary care in *recording* what occurs.
4. Be accurate in *recalling* details.



5. Use practical *exercises* in sight training (Rorschach Test and others).

Most of us fall into two types: the predominantly visual, or eye-minded; and the predominantly acoustical, or ear-minded. And some are motor-minded, but nobody is completely of any one type. Artists and authors are especially eye-minded; musicians, especially ear-minded.

(I happen to be so eye-minded that I carry a strange picture in my head of the position of all numbers from 1 to 100, where the design reiterates. I also hold an image of the shape of the year, with each month in a different place — and all of them in color! Even in memorizing music, I see every note in place on the printed page.)

Of our five senses, sight and hearing are the most important. Helen Keller, famous blind and deaf lecturer now 76 years old, urges us all to use our gift of sight fully — to use our eyes as if tomorrow we were to be stricken blind. She is living proof that observation can be cultivated even under the colossal handicaps of sight and hearing cut off.

Let me quote from Van Wyck Brooks' recent book entitled *Helen Keller:*

"For the world in which she lives herself is built by touch-sensations, devoid of physical color and devoid of sound, and she has written much about the hand by which she lives and which takes the place of the hearing and sight of others. Exploring the faces of her friends and people whom she has just met, she reads them as if she were clairvoyant, and she can distinguish the Yankee twang and the Southern drawl she has never heard by touching two or three spots on the throats of the speakers.

She says that hands are quite as easy to recognize as faces and reveal the secrets of the character more openly, in fact, and she can tell from hands at once whether people have large natures or whether they have only "dormouse valor." In the soft smooth roundness of certain hands, especially of the rich who have never known toil, she feels a certain chaos of the undeveloped; and, in her land of darkness and silence, she can feel with her own hands the beautiful, the strong, the weak, the comic. . . .

She can always distinguish Fifth Avenue from humbler New York streets by the odors issuing from the doors as she walks past. She knows the cosmetics that women are using and the kind of coffee they are roasting within and whether they use candles and burn soft coal or wood, just as she recognized St. Louis from the smell of the breweries miles away and Peoria from the smell of the whiskey stills. "Listening" with her feet, she says, in a hotel dining room, she knows the moods and characters of people who walk past her, whether they are firm or indecisive, active or lazy, careless, timid, weary, angry, or sad; and she will exclaim, "What lovely white lilacs!", knowing they are white by touch or smell, for in texture and perfume white lilacs differ from purple. . . ."

What Others Observe In Us

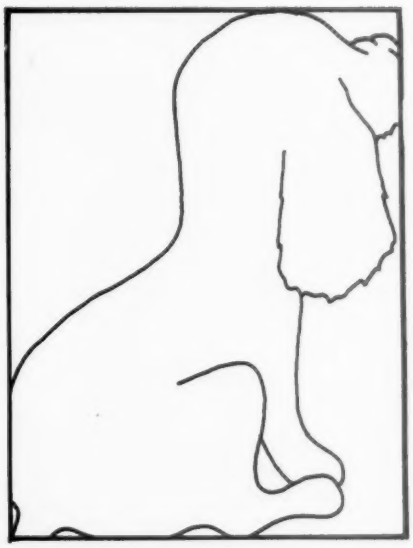
Everything we do and say, or don't do and say, communicates something about us. Our very presence or absence has a meaning; whether our work is finished or unfinished carries significance; and our desire to associate and participate reveals a great deal about us. Some men throw their weight around through their position, salary, status, and possessions. Others don't.

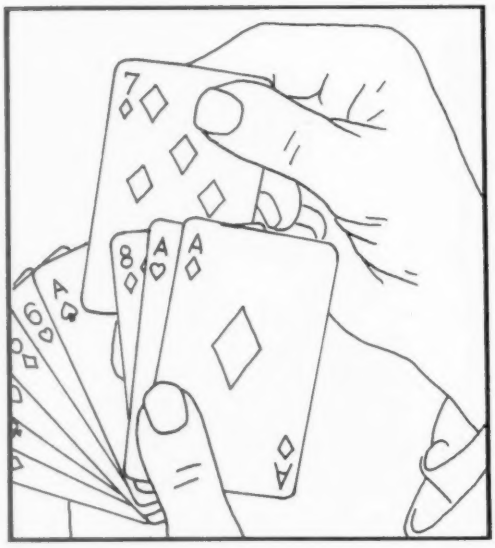
Even inanimate objects become significant symbols in business — like a silver water holder or carafe, a personal memo pad, a signature stamp, modern blond-mahogany office furniture, or heavy carpeting instead of linoleum or wooden floors — and communicate something about men and their company to all who observe.

Trifles show character and "make the sum of life," wrote Dickens. And we observe men and women continually, especially through these "windows":

1. *Actions* — habits; conduct; mannerisms; reaction to stress; their "breaking point"; their drive and interest
2. *Appearance* — facial expression; eyes; mouth; hands; complexion; Adam's apple; posture and gait; clothes
3. *Surroundings*— possession of worldly goods like house, car, airplane, golf clubs, books, antiques; quality of furnishings; order or disorder
4. *Attitudes* — opinions of men and events; attitudes toward wealth, women, children, and God; optimism or pessimism; interest in life for its own sake or for what they can get out of it.

Past actions, or performance, are more important than present appearances. Disraeli declared "there is no index of character so sure as the voice," and Emerson said that "what you are speaks so loud I cannot hear what you say." Surroundings, to me, are far less important that attitudes. And one of the ironies of life is that interesting persons we'd like to know better have a way of escaping us, whereas those we don't care to know better are ubiquitous! Too many ambitious young businessmen cultivate only those in higher rank-and-salary





brackets, thereby missing many rich associations. They observe only for selfish reasons.

Can We Believe Our Eyes?

Observation leaves a large area for difference, variance, and error. "I'm from Missouri — show me!" and "Seeing is believing" can't be trusted. No two people ever see any given person, object, event, or thing in precisely the same light. Human beings, more like chameleons than machines, are so given to change that nothing is permanent except impermanence.

Two amazing truths about this world are: No two human beings are exactly alike of the three billion or so in it; and no human being is merely one static personality to all others, but many different personalities to many different people. One man's villain is another man's hero!

In 1954 a television play presented the story of a struggling young artist whose ambition was to paint the perfect picture of a madonna. The point of the play was that observers saw in this artist what they *wanted* to see; his mother saw one person; the taxi driver saw another; the building superintendent, another; and the eavesdropping scrubwoman, still another. When the artist's model reeled drunkenly into his studio one morning, he pushed her aside in disgust and disappointment. She fell, fracturing her skull. Was it her accident or his murder?

In Eugene O'Neill's *Strange Interlude* the leading character, Nina Leeds, can be observed as a daughter, a wife, a mother, and a mistress. Many plays and novels reveal how we vary in our observations. Yes, Freud is right: we see what we *want* to see, hear what we *want* to hear, and remember what we *want* to remember.

In those we love, we observe lovable traits; in those we hate, we observe hateful traits. It all depends on *us!* In looking at anything, *your* eyes focus on a certain set of details, whereas *my* eyes focus on a different group of details. Can we train our eyes to catch the most important details? Yet what *are* the most important details, anyway?

Because we see things not as *they* are, but as *we* are, and because people are complex creatures, we should be on guard constantly against forming judgments from insufficient and erroneous observation. Trivial actions are often dead giveaways of character, but we have to keep our eyes peeled for signs that fail. One detail never tells the whole story.

What Do Actions Communicate?

Shakespeare says, "All the world's a stage, and all the men and women merely players." A drama is a story told in action, but few employees consciously play a role while working. Models and receptionists, perhaps. Yet doing is the major role of most employees in industry and business, and demonstration or "showing how" is the most effective communication for much job training.

Actions are (1) *habitual, automatic,* or *customary,* and (2) *occasional, temporary,* or *done in crisis.* So, we observe to get information about quantity and quality of performance, employee attitudes, character traits, work habits, and physical surroundings. These are highly important to all supervisors, who are responsible for others' safety, health, and physical comfort as well as for productivity, output, and harmonious relationships.

We observe to detect anything unusual or "out of line," much as an internal auditor examines a statistical report. We observe to gather facts at first hand, but we run into many errors in the realm of observation. We should remember that we seldom get all of *the* facts from observation; instead, each of us gets *our* set of facts. In observing, we're prone to interpret the way we want to.

What to Look For

A man's *walk* is an automatic action that communicates personality. Usually a frank, open-hearted fellow strides along easily; a lazy person shuffles or drags his feet; a slow-witted guy steps heavily; a reckless or nervous chap has a springy, headlong, or precipitate gait. There's a lot of difference between Emmett Kelley's shamble and Marilyn Monroe's swing!

The *eyes* and *mouth* are chief centers of facial communication. Artistic people stare dreamily into space; those with shifty eyes may be nervous or timid rather than guilty or untrustworthy; and men who look upward, not downward, all the time are prone to be optimistic and idealistic. Too many businessmen look at the ground instead of the sky! And most of us prefer open, candid eyes that look straight into ours, without staring like a brazen criminal.

A *mouth* that is broad often indicates serenity and generosity, whereas a small mouth with thin lips denotes primness. There's an old wives' tale that space between the teeth indicates a sensuous, often a sensual, nature. Watch the mouth in a crisis: it's a barometer to a man's determination far more reliable than a strong or receding chin.

Hands are a pretty reliable index to character. A man with his hands in his pockets all the time will never "set the woods on fire." He'd have to take at least *one* hand out of his pocket! People who use their hands freely in talking (a trait of teachers, engineers, and others) are likely to be warm-hearted creatures of feeling. And whose hands could be more expres-

sive than Ed Norton's (Art Carney's) in *The Honeymooners?*

A man who stands, legs apart, with both arms akimbo or across his chest may be showing either resistance to you or assurance in himself. Demagogues, sooner or later, raise their arms above their shoulders with arms outstretched. How can we cultivate quiet, peaceful hands? By forgetting them — being totally unaware of them.

Men are seldom conscious of their mannerisms; women usually are, even to the point of cultivating them and cashing in on them. The angry crushing out of a cigarette stub; the nonchalant flick of a cigarette holder; the cracking of one's finger knuckles (like Alexei, the husband in *Anna Karenina*); picking one's nose abstractedly; eternally prinking one's hair; or using curlicues and telltale letter-formations in one's handwriting — all these mannerisms can *help us understand people.* But here are some important warnings:

1. *Don't pigeonhole a man by his dominant trait.*
2. *Remember that one trait never reveals the total man.*
3. *Get as complete a picture as you can from many traits.*

Mental sickness is increasing in our country. In 1952 nine million people were confined to our mental institutions, or one out of 18. A similar number were ill but not confined to sanitariums. All supervisors need to *observe closely* to detect fear, worry, fatigue, or nervousness. We can usually recognize the worried worker by:

(1) Sudden change of behavior
(2) Irritable disposition
(3) Sudden sadness or absent-mindedness
(4) Too many mistakes or accidents
(5) Increased absenteeism or fatigue
(6) Excessive use of alcohol.

When we observe these signs or symptoms, we should arrange a heart-to-heart talk with the man to determine what is wrong. After we learn *why* (the cause), we should try to help the employee effect a cure.

We may relieve the employee of physical overstrain and mental anxiety, consult with the personnel manager, and enlist medical aid if it's needed. Sometimes a shift in duties will help; sometimes community aid is available. In short, the foreman should become the confidential adviser of the employee in a friendly, sensible way.

Importance of Observation

All businessmen — supervisors, salesmen, and lawyers especially — need to cultivate their ability to observe. And they can. Traffic cops learn to nab numbers on license plates of cars, and newspaper reporters learn to watch the five W's of a story. FBI agents undergo a series of tests on observation to train themselves in rapid and accurate detection. One favorite stunt in law schools is the "planned event" that students witness and then testify about in trial — with the usual large number of errors sworn to "under oath."

Among all skills of communication — thinking, observing, writing, reading, talking, and listening — *observing* is highly important. It operates (or should) while we think, write, read, talk, and listen. In that respect it is almost as important as thinking, which operates simultaneously with all others, too. Observing also includes communication by smell, taste, touch, and movement (motion or acting).

Observation is indispensable to all businessmen because

1. *It is a universal medium of experience.*
2. *It is a proved source of information.*
3. *It is a sound basis of judgment.*
4. *It is a rational cause of action.*
5. *It is a reliable essential in handling people.*

Observation is the chief tool in selecting, upgrading, and counseling all employees. Employment supervisors, who interview applicants and hire new men, need skill in observing to estimate the potential of newcomers. Fitting the right man into the right job saves the company's time and money. Failure to develop a good man after he's hired often results from inaccurate or biased observation. Workers get pigeonholed much too easily! Any management development program, too, leans heavily upon the knack of spotting executive capacity. In fact, no decisions are made and no problems are solved in business without this valuable instrument — observation. Several "look-see" meetings are worth all the hearsay in the world!

How Do You Size Up People?

1. *Put behavior ahead of appearance.* Too many businessmen select steno-secretaries for the size of their breasts and the shape of their legs. "What's wrong with that?" you are asking. Nothing — but it's a sign of emotional immaturity. If a man's work is an endless grind of dreary routine, of course, there's no sense in surrounding himself with a drearier raft of old bags. Yet if he'd looked for efficient performance and cheerful attitude in the first place, maybe his office work wouldn't be a blob of endless monotony now. (Gong! End of round 1.)

2. *Doubt your pet theories.* That old trick of purposely dropping some object to see whether an applicant will break his neck to pick it up is no test of politeness. Nor is asking for a fountain pen and observing the quick or clumsy response any proof of efficiency.

Most pet theories are unreliable. A beautiful office steno may not be a dumb Girl Friday, and a fellow who shows up poorly on all the tests may be excellent for this job because he has *the will to work.* Again, a practical "self-made" engineer may shy away from hiring an engineer with several degrees who could supplement his work perfectly.

By and large, we're all prone to prefer people like ourselves and disparage those who are much different from us. But it's well to remember our own prejudices and make plenty of allowances for them.

3. *Avoid hasty conclusions.* Frequently our first impression is more lasting than correct. Snapshots are snap judgments. We need to observe, again and again, under different conditions and various circumstances to get a full-length portrait. When we *understand motives,* we often change our mind about actions.

You don't like this new employee? Why not? He reminds you of a guy you once hated in college; he threatens your present security in your job; or — you won't believe this! — he has some traits that are just like your own.

And because you don't like this employee, you warp your estimate by looking for his weak points. If you liked him, you'd be making alibis for them and raking and scraping to find his good points.

4. *Look for the good in others.* If we develop the habit of overlooking foibles or weaknesses in others, we soon discover endurable qualities. They're there. The skinflint boss who died last week left $20,000 to the Heart Fund and his eyes to an eye-bank! The sourpuss accountant in Room 687 has just adopted a month-old baby boy!

An executive once held up before the blackboard a sheet of white paper with a black X in the center. "What do you see?" he asked. About fifty men saw a black X; not a single one saw the snow-white paper!

Search for the good traits in everyone. Then tell others what you have found. This habit in observation makes everybody feel better. It increases your own cardiac dimensions; it makes the ceiling of your heart a little higher and its walls a little wider; it enlarges your soul. ★ ★ ★

Glossary of Gas Industry Terms - Li to Op

Liquid Fuels: The liquid fuels most frequently used are: Petroleum and refinery residues, shale oil, tar from the dry distillation of coal wood, the tar oils obtained by the distillation of coal tar, benzine, and denatured, methylated or wood alcohol.

Liquid Gold: A popular name for petroleum oil.

Liquid Level Control: A combined float-chamber and a control valve that can be attached to a vessel in such a manner that the level of the liquid is automatically controlled.

Liquid Purification: The removal of undesirable constituents from a gas by passing the gas through a liquid that will dissolve or remove the impurity.

Liquid State: Physical condition of a substance in which it has a definite volume and conforms in shape to the containing vessel.

Live Oil: An oil containing entrapped gas.

Live Steam: Steam having useful energy available by reason of its temperature and pressure as distinguished from exhaust steam that has had most of its available energy utilized.

LPGA: Abbreviation of Liquefied Petroleum Gas Association.

Load: The rate of gas utilization per unit of time for a given system or point in a system. To load a governor means to set the governor to maintain a given pressure at that point as the rate of gas flow through the governor varies.

Load Center: The geographic center for all gas loads of a specified system or area.

Load Curve: A graph in which the load of a gas system or segment of a system is plotted against intervals of time.

Load Density: The concentration of gas load for a given area expressed as gas volume per unit of time and per unit of area.

Load Dispatching: The operation of a gas system to supply gas in quality and in quantity sufficient to meet the demand.

Load Factor: The ratio of the average volume of gas transported by a gas system, or segment of that system, during a specified time interval to the maximum volume transported during a comparable time interval. Load factors may be hourly, daily, weekly, monthly or annual.

Loaded Governor: A governor so adjusted that an increase in the load produces an increase in the delivery to compensate for increased system pressure drop and maintain gas pressure throughout the system.

Location Class: A geographic area classified according to its approximate population density and its other characteristics that are considered when prescribing types of construction and methods of testing pipe lines and mains to be located in the area.

Lock In: To unseal a gas meter and start gas service by opening the meter cock.

Lock Out: To seal and lock a gas meter and shut off the cock so that gas cannot be used.

Lock Wing Cock: A valve between the gas service line and the gas meter, so arranged that it can be locked in a closed position.

Log: A diary of a well that is being drilled, giving details of depth, characteristics, thickness and contents of strata drilled through.

Long Flame Burner: A burner designed to give a mixture of fuel and air so that the fuel burns slowly and produces a long, luminous flame.

Long Residuum: Distillation residue of crude petroleum containing all the lubricating stocks of the crude oil.

Long Ton: Weight measure equal to 2240 lb.

Look Box: A metal box having glass faces set into a liquid line so that flow through the line may be observed visually.

Loose Black: Carbon black of low density.

Lower Heating Value: The gross heating value less the latent heat of vaporization of any water vapor formed during the combustion; the net heating value.

Low Pressure: See: Pressure.

Low-Pressure Gas Distribution System: A gas distribution system, or the mains of a segment of a distribution system, operated at low pressures of less than 15-in. WC.

Low Volatile Coal: Bituminous coal containing a proportionately small percentage of volatile materials.

LP Gas-Air Mixtures: Mixtures of liquefied petroleum gas and air to obtain a desired Btu value and capable of being distributed through a distribution system; used for standby and peak-shaving by gas utilities.

Lubricated Plug Cock: A valve in which a pierced plug rotates in a tapered cylindrical body to open and close flow through the valve and which is lubricated by a screw in the top of the plug, forcing grease through the body of the plug and into channels between the plug and the valve body.

Lubricating Grease: A compound of a soap and mineral or petroleum oil used to lubricate slow-moving machinery or other equipment that will not retain flowing oils.

Lubricating Oils: Heavy distillates from the fractional distillation of petroleum, following kerosine in the distillation, distilling between 253-317 F.

Luminous Flame Burner: A burner in which air for combustion is wholly supplied from the surrounding atmosphere of the flame and that gives off light due to unburned carbon particles being heated to incandescence.

M

Magnesia Cement: Magnesium oxide (MgO) that is mixed with water and used as an insulating covering for hot pipes, vessels and furnaces. It is sometimes mixed with an approximately 15 per cent asbestos fiber as a filler.

Magnesite: A naturally-occuring mineral magnesium carbonate ($MgCO_3$) that is ground, formed into bricks or other shapes and fired to a magnesium oxide. The bricks and shapes

are used as refractory furnace linings. Also, magnesite is used as a source of magnesium metal.

Main: See: Gas Main.

Main Air: See: Combustion Air.

Main Extension: Gas mains added to an existing distribution system to serve new customers.

Main System: The network of distribution piping to which customer service lines are attached. Generally, large pipes are laid in principal streets with smaller laterals extending along side streets and connected at their ends to form a grid; sometimes laterals are brought to dead ends.

Make: The quantity of product obtained from a well or process in a unit of time.

Make and Break, Ignition: An electric system of ignition used upon some gas or gasoline engines that depends upon alternately the completing and the breaking of an electric circuit.

Make and Break, Rotary: A rotary machine designed to make up and unmake screwed tool joints or casing.

Make Oil: Oil converted into salable gas in the oil gas process, as distinguished from oil used to heat the generators.

Make Per Run: The quantity of salable gas produced per operating cycle of a water gas set.

Make-Up: To screw together, as drill pipe or a string of tools.

Make-Up Water: Water added to a tank, boiler, or other vessel to maintain a pre-determined liquid level.

Manhole: An opening into a tank, boiler, furnace or other equipment through which a man can enter the equipment; can be sealed with removable plate or door.

Manifold: A pipe to which three or more outlet pipes are connected.

Manometer: A tube in the shape of a U, partially filled with liquid of suitable density. When points of different pressure are connected to respective ends of the manometer, the liquid is pushed up in the low pressure side of the manometer and the difference in liquid level between the two sides of the U is an indication of pressure difference.

CORRECTION: The word **"Carborundum"** which appeared in Part 2 of the Glossary was inadvertently described as another name for silicon carbide. It is a registered trademark of The Carborundum Company for products in which the abrasive is fused alumina, garnet, flint, and diamonds in addition to silicon carbide.

Mansfield Oil Gas Producer: An instrument designed to produce oil gas from any kind of oil or fat as well as from paraffin oils.

Manufactured Gas: A combustible gas mixture produced synthetically in a gas plant and used as a fuel; also called city gas.

Mariotte's Law: See: Boyle's Law.

Marsh Gas: Methane, CH_4. The chief constituent of plants in swamps. Not uncommonly misinterpreted as an indication of the presence of petroleum.

Mass: The quantity of matter composing a body; also the resistance or inertia of a body to motion or change in motion.

Matter: Anything occupying space and having mass or weight.

Maximum Allowable Hoop Stress: The maximum hoop stress permitted by the ASA code for the design of a piping system. It depends upon the material used, the location of the pipe, and the operating conditions.

Maximum Allowable Test Pressure. The maximum internal fluid pressure permitted by the ASA code for testing for the materials and locations involved.

Maximum Actual Operating Pressure: The maximum operating pressure existing in a piping system during a normal annual operating cycle.

Maximum Allowable Operating Pressure: The maximum pressure at which a piping system may be operated in accordance with the provisions of the ASA code. It is the pressure used in determining the setting of pressure relieving or pressure limiting devices installed to protect the system from accidental over-pressuring.

Maximum Demand: See: Demand.

MCF: A gas volume measure of 1000 cubic feet.

Mean: The average, determined by dividing the sum of several items by the number of items.

Mean Stack Temperature: The average temperature of flue gases in a chimney or stack.

Mechanical Charger: A motor- or engine-driven device for feeding solids into reaction equipment, such as loading coal into a coke oven.

Mechanical Draft: A flow of gas or air, through a duct or chambers, produced by mechanical means, such as a blower or fan.

Mechanical Efficiency: Compressor: ratio of work done on the compressed gas to the work produced to drive the compressor. Engine: ratio of brake horsepower to indicated horsepower of an engine.

Mechanical Equivalent of Heat: The conversion factor for transforming heat units into mechanical units of work. One Btu equals 778 ft-lb.

Mechanical Grate: A motor-driven grate, in constant motion to shake ash from a fuel bed into the ash pit and to break up clinkers in the fuel bed and maintain an even fuel bed, in such equipment as a water gas generator.

Mechanical Joint: A method of joining two pieces of pipe by means of bolts, with a gasket squeezed in the joint to seal against leakage into or out of the pipe.

Mechanical Pressure Atomizing Burner: A burner in which oil is fed through a small orifice under sufficient pressure to cause the oil to break up into fine droplets or mist.

Medina: Oil and gas producing sandstone of Middle Silurian formation that yields oil, chiefly in the Ontario province of Canada.

Melting Point: The specific temperature at which a substance undergoes a change of state from solid to liquid.

Mercaptan: An organic chemical compound having a distinctive odor in very small concentrations in air; one part in a million parts of air. Used to odorize natural and LP gases, that are virtually odorless, for detection of leaks.

Mercury: The only element existing normally in liquid form. Its common name is quicksilver due to its silver color and quick manner of rolling about on a hard surface without wetting the surface.

Mercury Seal: A liquid seal using mercury as the liquid and used as a house regulator safety device to prevent passage of high-pressure gas into the low-pressure system.

Meter: An instrument for measuring and recording the volumes of gases and liquids. The metric unit of length. One meter equals 39.37 in.

Meter Bar: A metal bar for mounting a gas meter, having fittings at the ends of the bar for connecting the inlet and outlet connections of the meter and to which, in turn, the gas inlet and house piping are connected.

Meter Books: Books in which successive readings of utility customers' meters are recorded by gas utility meter readers. The difference between successive readings is the gas consumption for the period.

Meter Density: The number of meters per unit of area or per unit length of distribution main.

Meter Index Dials: The measuring dials on the index face of a meter.

Meter, Orifice: A meter that employs the differential pressure on either side of an orifice to obtain a factor with which to calculate the quantity of flow.

Meter, Proportional, Gas: A meter that automatically measures a proportional part of the volume that flows through it.

Meter Prover: A device for testing the accuracy of a gas meter. A quantity of air is collected over water in a calibrated cylindrical bell and then passed through the meter by allowing the bell to sink into the water. A comparison of the measured amount of air passing through the meter and the amount registered on the meter dial gives a measure of meter accuracy.

Meter Seal: A metal wire or tape seal attached to a gas meter or a service cock in such a way as to prevent its being opened by an unauthorized person, without detection.

Meter, Venturi: A meter that employs a venturi tube to determine the factor for use in calculating the flow.

Methane: The first in the paraffin series of hydrocarbons (CH_4). It is colorless, odorless and inflammable and forms the major portion of marsh gas and natural gas.

Metric System: A decimal system of weights and measures based on international standard units of meter and gram.

Micrometer: An instrument by which minute measurements may be made. The machinist's micrometer is graduated to read measurements to the thousandth part of an inch.

Migration: The movement of oil or gas through the pores of rock. The rate of movement varies with the permeability of the rock, the viscosity of the oil, and other factors.

Mineral Matter: Substances found in a natural state and composed of inorganic compounds and elements.

Mineral Wool: Fibrous material, produced by mixing stone and blast furnace slag and blowing steam through it, used as thermal insulation.

Minimum Firing Rate: Lowest rate of fuel input at which operation of a burner or process can be sustained.

Mixed Gas: Fuel gas in which natural gas or liquefied petroleum gas is mixed with manufactured gas to obtain a resulting gas with the same or higher Btu value than in the manufactured gas alone.

Mixing Chamber or Tube: Space in which primary air and gas are mixed in combustible proportions ahead of the burner port or tip.

Modulating Control: Control system in which the controlled medium, such as a fuel to a furnace, can vary smoothly over the control range to maintain the desired condition, such as furnace temperature. This is as opposed to a two-position control, such as an on-off fuel control.

Molar Gas Constant: R in the general gas law, $PV = nRT$, equivalent to 74.73 ft-lb.

Molecule: Smallest possible division of a chemical compound that retains the physical and chemical properties of the compound.

Mond Fuel Gas: A producer gas made from low grade coals and lignites, the generation of the gas being so controlled that the various by-products are retained.

Mond Gas: A variety of semi-water gas.

Monitoring Regulator: A pressure regulator set in series with another pressure regulator for the purpose of automatically taking over in an emergency the control of the pressure downstream of the station in case that pressure tends to exceed a set maximum.

Mope Pole: A lever that is generally made from the body of a small tree, and is used in pipe line construction work at the rear end of the back pipe jack to support the pipe and as an aid in the removal of the jack when lowering the pipe into the ditch.

Mormon Board: A broad board, reinforced and provided with handles and eye bolts. Used to back-fill pipe line ditches by means of teams or tractor.

Motor- or Solenoid-operated: Term applied to mechanical motion, such as in a valve or switch, activated by an electric motor or electro-magnet.

Mouthpiece: Cast iron frame and door on the end of a coal gas retort through which coal is charged and coke removed.

Muffle Furnace: Materials-processing furnace containing a chamber of heat-resistant materials called a muffle, around which hot flue gases flow, heating the muffle and the materials being processed without exposing materials directly to the flue gases.

Multiple Deck Ovens: Commercial kitchen oven consisting of several shallow sections stacked vertically, with either individual control or with a single control for the stack.

Multiple Lift or Section Gas Holder: See: Water Sealed Gas Holder.

Multiple Washer: Gas washer effecting multiple contact between gas and washing fluid by means of baffles and ducts.

Multistage Compressor: Compressor in which the gas being compressed passes in series through two or more compression cylinders.

N

Naphtha: Light, colorless-to-pale yellow liquid, distilled from petroleum and having a specific gravity of 0.631 to 0.660+.

Naphtha Gas: Illuminating gas charged with the decomposed vapor of naphtha.

Naphthalene: White solid hydrocarbon ($C_{10}H_8$) obtained from coal distillation.

Natural Convection: Transfer of heat by movement of a fluid resulting from the density differences in differing temperatures from one point of the fluid to another.

Natural Draft: Pressure differential across a combustion chamber caused by hot gases rising in a chimney or stack, thereby creating a partial vacuum in the chamber and drawing combustion air into the chamber.

Natural Gas: Combustible gaseous hydrocarbons occurring naturally in the earth's formations and formed in past geologic ages.

Natural Gas Liquids: Liquid hydrocarbon mixtures recovered by condensation and absorption from natural gas after it has been produced from the underground formations; includes natural gasoline, condensate and liquefied petroleum gases.

Natural Gas Liquid Reserves: Volume of natural gas liquids in the natural underground formations. The proved recoverable natural gas liquids reserves is the volume of natural gas liquids, obtainable by presently used methods, from the proved recoverable natural gas reserves.

Natural Gasoline: Pentane and heavier hydrocarbon mixtures recovered or extracted from natural gas as it is produced from the underground formations.

Natural Gas Reserves: Volume of hydrocarbon gas existing in the natural formations of a specified area, which may be a field or pool. Proved recoverable gas reserve is the volume of gas that can be obtained from a particular area under specified physical conditions and with current operating procedures.

Natural Oil: See: Petroleum.

Needle Bearing: A bearing consisting of rollers pointed at both ends like needles and contained in a shell fitting around the outside of the rollers.

Needle Valve: A small valve that is opened and closed, to permit or restrict fluid flow, by the movement of a pointed plug or needle in a tapered orifice in the valve body.

Neoprene: Heat-resistant synthetic rubber that does not deteriorate on continued exposure to petroleum hydrocarbons.

Net Caloric Value: See: Lower Heating Value.

Net Heating Value: See: Lower Heating Value.

Neutral Atmosphere: Gas content of a metal-treating furnace in which the metal is not to be oxidized or deoxidized. In general, a gaseous environment that does not react chemically with materials that it contacts.

Neutral Flame: Flame in which complete combustion takes place so that the flame is neither reducing nor oxidizing.

Neutral Oils: Trade name for oils distilled from petroleum without "cracking." Heavier than paraffin oils but will not emulsify in contact with water as do paraffin oils.

Neutron: Atomic nuclear particle having the weight of a proton but possessing no electrical charge.

Nipple: Tubular pipe fitting, usually threaded at both ends and less than one foot in length. Also a length of pipe considerably shorter than a standard joint.

Nitric Acid: A powerfully active acid that combines with nearly all metals, and that has a strong oxidizing effect on organic materials.

Nitrogen: An element (N) normally gaseous. It is odorless, colorless, and chemically will not support combustion and is generally inert. Composes 79 per cent of earth's atmosphere in the free state.

Nominal Wall Thickness (t): Under the ASA code pipe may be ordered to a computed wall thickness without adding an allowance to compensate for the underthickness tolerances permitted in approved specifications.

Nonane: Ninth member of the saturated or paraffin series of hydrocarbons (C_9H_{20}); boiling point 301 F.

Non-associated Natural Gas: Free natural gas in the reservoir; gas that is not in contact with nor dissolved in crude oil in the reservoir.

Non-combustible: Substance or gas that will not combine with oxygen in the generation of heat.

Non-condensable Gas: Refinery gases that do not condense to a liquid while passing through a condenser under the normal operating conditions.

Non-ferrous Metal: Metal other than iron or any mixture of metals not containing iron.

Normal Pressure: Unless otherwise designated, it is atmospheric pressure at sea level: 14.7 psi or 760 mm of mercury column.

Normal Thread Engagement: Length of overlap in a tight, threaded pipe connection.

Nozzle Mixing Burner: Burner device in which the fuel and air are kept separate until discharged from the burner into the combustion chamber; flashback does not usually occur in this type of burner.

Nucleus: Heavy central core of an atom.

O

Oakum: Shredded hemp fibers used to caulk or fill joints such as in bell and spigot pipe; oakum may be dry or saturated with tar or oil.

Octane: Eighth member of the paraffin series of hydrocarbons (C_8H_{18}). Liquid at normal temperatures and pressures; boiling point 258 F.

Octane Number: An arbitrary scale used to designate numerically the knock-characteristics of a motor gasoline; represents the percentage of iso-octane in a reference fuel giving equal performance with the fuel being rated, using a standard procedure.

Odor Test: A crude method of testing the degree of refining by the odor of the product, whether "sweet" or "sour."

Odorant: Substance giving a readily-perceptible odor at low concentrations in the material into which it is mixed and used as a warning sign of the presence of the material, such as natural gas.

Off-peak: The period during a day, week, month or year when the load being delivered by a gas system is not at or near the maximum volume delivered by that system.

Offset Swivel: A pipe fitting that can be rotated in attaching a gas meter to gas piping for correction of misalignments in the piping.

Ohm: Practical unit of electrical resistance and equals resistance through which the fall of potential is one volt when the current strength is one ampere.

Oil Asphalt: Heavy, black residuum remaining from the distillation of crude petroleum.

Oil Atomization: Spraying oil through a nozzle so that it is broken up into a mist or fine droplets.

Oil Burner: Combustion device that is designed and constructed so that it automatically mixes air and fuel oil in the proper proportions for burning.

Oil Cracking: See: Cracking.

Oil Fogging: Spraying a fine mist of oil into a gas stream of a distribution system to avoid the usually drying effects of gas in certain distribution and utilization equipment.

Oil Gas: Gas produced by cracking a vaporized oil and fixing the vapors into a permanent gas at ordinary temperatures and pressures.

Oil Refinery. Processing plant in which crude petroleum is subjected to various chemical and physical treatments, such as cracking, reforming, sweetening, and distillation, to produce a number of relatively pure mixtures, such as gasoline, kerosene, fuel oils, lubricating oils and greases.

Oil Reforming: Step in producing carbureted water gas in which a fraction of the carburetion oil is cracked to useful gas in the water gas generator.

Oil Scrubbing: The removal of certain impurities from manufactured gas by passing the gas through an oil spray or bubbling the gas through an oil bath.

Oil Spray: A nozzle through which oil is forced to emerge as a fine mist.

Oil Vapor: Vaporized or atomized oil.

Olefiant Gas: Ethylene, heavy carbureted hydrogen.

Olefiant Gas or Ethylene: C_2H_4 that is sometimes found in natural gas is the most abundant illuminative constituent in goal gas.

One Mile Population Density Index: A number roughly proportional to population density, applicable to a specific one mile length of pipe line or main and used in some cases to determine design and/or test requirements.

On-Off Control: Device that maintains the controlled media at desired points by turning the input on or off, but which does not modulate or proportion the input flow.

Open Circuit: A break in an electrical transmission line that prevents the flow of current.

Open Flow Test: A test made to determine the volume of gas that will flow from a well in a given time when the large valves are wide open.

Open Pressure: The pressure on a gas well that has been open long enough for the accumulated pressure to waste.

Open Top Range: Cooking stove on which the cooking containers are supported by open grills so that the burner flame impinges directly on the bottoms of the containers.

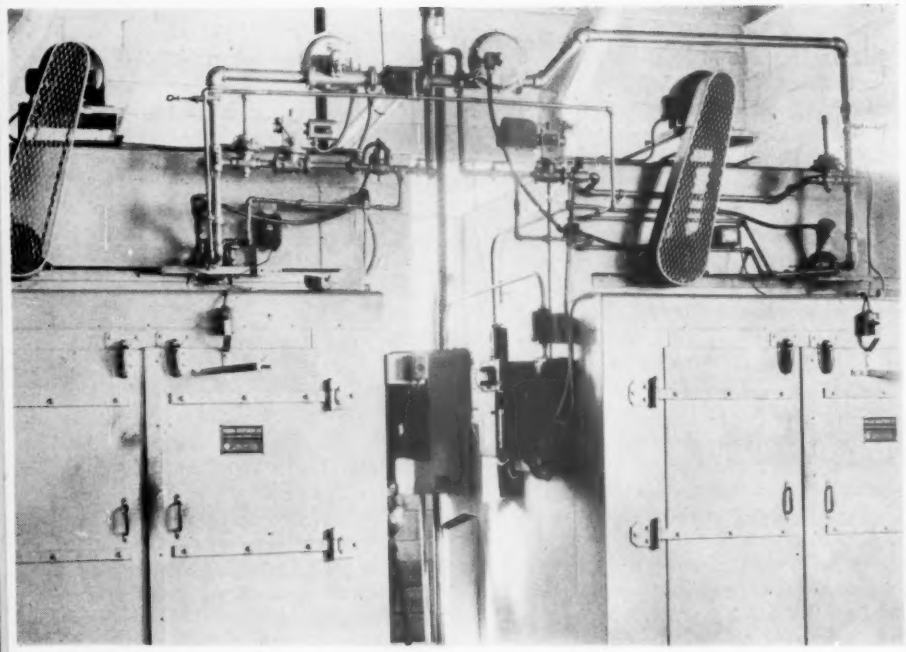
Operating Company: As used in the ASA code is the individual, partnership, corporation, public agency, or other entity that operates the gas transmission or distribution facilities.

Operating Stress: The stress in a pipe or structural member under normal operating conditions.

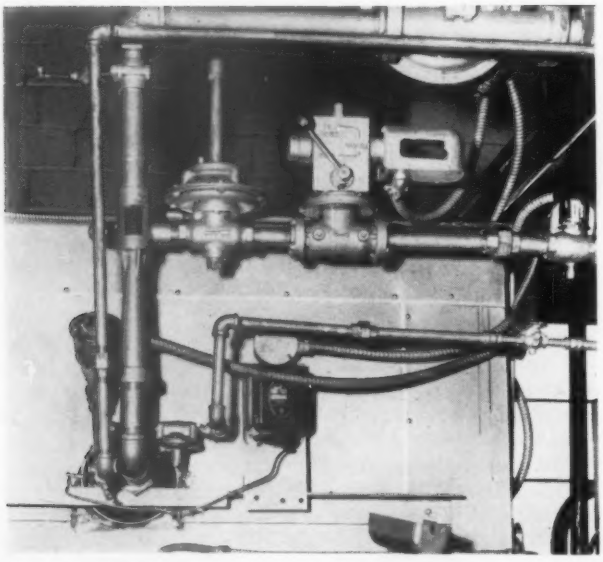
Optimum Air Supply: Volume of air delivered to a burner that will produce the maximum thermal efficiency under specific operating conditions.

Part 8 of Gas Fundamentals will appear in the next issue.

Switch to Gas Heat Saves $5400 Annually



Two indirect fired industrial ovens now operate for $150 a month for gas rather than $600 a month for electricity.



Close-up of the complete combustion assembly as supplied for each oven.

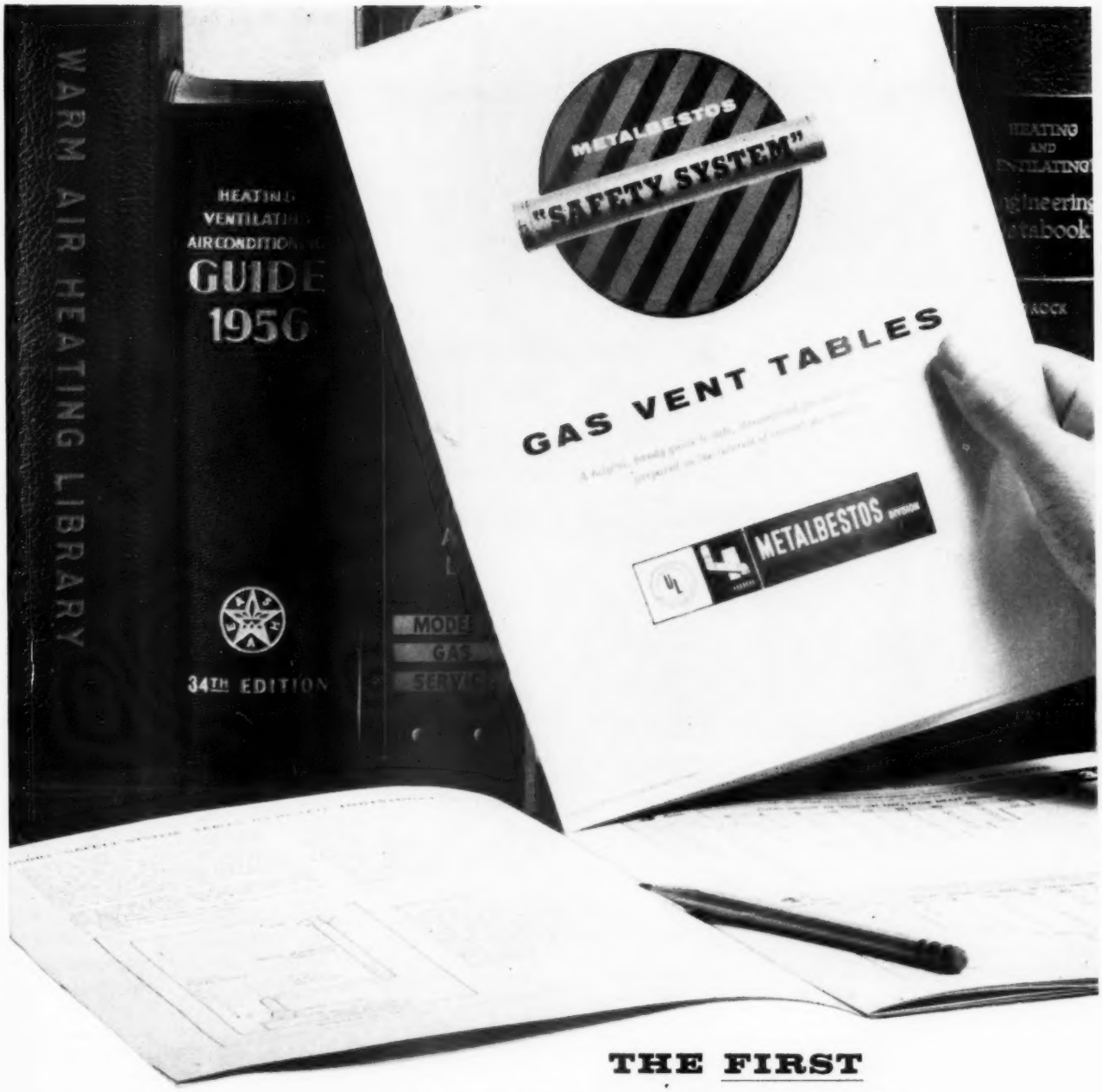
EXTREMELY high electrical bills caused Pan Coating, Inc., Cleveland, Ohio, to re-examine the wisdom of firing its industrial processing ovens by induction heating. A switch to gas firing proved profitable to the extent of $5400 saving of fuel cost per year.

The process involved is baking a silicon solution onto large commercial size baking pans, after they have been thoroughly cleaned and dried. The pans are baked at 450F for four hours which hardens the coating and makes possible 300 bakings without any necessity of greasing the pans. Pans are used for all commercial baking such as bread, rolls, muffins, etc.

The two ovens which were converted were indirect fired and 5-ft wide, 6-ft high by 10-ft long, equipped with circulating fans. Cost of current for induction firing electrically averaged $600 per month. Eclipse Fuel Engineering supplied all the necessary combustion equipment to convert the ovens to gas firing, including line burner assemblies, low pressure proportional mixers, blast pilot assembly, automatic air control valve, and safety shutoff valve. Maximum input per burner assembly is 400,000 Btu.

Temperature and input are automatically controlled by an Eclipse series "CRS" valve mounted between blower and mixer. The combustion safeguard system consists of a Wheelco Flameotrol unit with flame rod assembly. A Wheelco indicating and recording controller regulates the temperature in the oven, and gives a printed record of heating cycles. Wheelco Limitrol is used to prevent temperature rise above operating limits.

Gas bills now average about $150 per month, compared to $600 monthly spent on electricity. As a result, the company is now planning to convert other ovens to gas firing with full expectation of similar economies. * * *



THE FIRST STANDARD REFERENCE FOR CORRECT VENTING!

The new Metalbestos "Safety System" Gas Vent Tables set the standard for efficient gas venting ...by telling you the practical, correct answers to your gas vent questions.

- ▶ Will the gas vent operate correctly?
- ▶ What's the simplest way to install a gas vent?
- ▶ How much vent pipe do I need for the job?
- ▶ What's the most economical way to install a vent?

The Metalbestos "Safety System" Gas Vent Tables give quick, accurate answers to venting questions such as these. That's why the new Metalbestos Gas Vent Tables are a necessary tool for gas dealers, builders, installers, inspectors, and utility men.

Send today for your free copy of the new Metalbestos "Safety System" Gas Vent Tables. Write Dept. AA-12

METALBESTOS DIVISION

Stocked by principal jobbers in major cities. Factory warehouses in Akron, Atlanta, Dallas, Newark, Des Moines, Chicago, New Orleans, Los Angeles

AMERICAN Gas Journal Merchandising

NINETY • EIGHTH YEAR

News and Features Designed to Further Cooperation Among Utilities, Dealers, and Manufacturers

NUMBER 56 • DECEMBER, 1956

Merchandising, Manufacturing Meet in Milwaukee "Marketing Spectacular"

"Presidential Conference" heralds aggressive Milwaukee Gas Light Company development program as industry's top leaders gather

A "marketing spectacular," first of its kind in the natural gas industry, was produced October 30 by Milwaukee Gas Light Company for 106 company presidents and top sales management executives representing 58 gas appliance and equipment manufacturing firms.

Aim of the meeting was to dramatize the metropolitan Milwaukee market's potential for the sale of gas burning equipment and sale of natural gas. A remarkable sales effort, the meeting was predicated upon the more than two-fold increase in the supply of natural gas now available for Milwaukee.

In planning, production, and follow-through, it represented a fundamental grass root approach to the problem of unifying the efforts of gas appliance and equipment manufacturers with those of a gas distributing utility.

The meeting was produced and presented by MGL's sales, advertising, sales promotion, sales training, and public relations personnel, in cooperation with Steltenkamp-Wilson & Associates, of La Grange, Illinois, sales and marketing consultants, and the Cramer, Krasselt Company, MGL's advertising agency.

Hard hitting illustrations of points by the speakers were a feature of the meeting. Theatrical spotlights punched home graphic illustrations presented to the audience with the help of four models.

To dramatize the impact and volume of Milwaukee Gas Light Company advertising, designed to establish the *gas idea* and to build consumer acceptance and demand for gas and gas appliances, a novel replica of the Milwaukee Gas Light Company building was erected as the executives watched.

The foundation was labeled to represent the 4,700,000 advertising impressions made by AGA's program in the Milwaukee market. Next came lower segments of the building representing 160,000,000 ad impressions made by billboards; 137,000,000 newspaper ad impressions. The building soared upward with floors representing 69,000,000 television impressions; 51,000,000 radio impressions; 41,000,000 truck card impressions; and 13,000,000 weekly, foreign language and special interest publication advertising impressions. It was capped by direct mail sales messages that reached 247,000 gas company customers.

The replica of the building, when completed, stood about six feet high and represented an advertising program totaling 489,947,000 advertising impressions on the Milwaukee market.

Other props and devices used to dramatize the facts presented at the meeting included:

Actual photographs of the 684 appliance dealers in the Milwaukee market available for inspection by the gas industry executives at the meeting.

Giant blowups of newspaper front pages on which the Milwaukee Gas Light Company's dramatic story of expanded gas supplies were shown. An effective skit that dramatized the sales difficulties caused by inadequate dealer supplies of gas appliances and the lack of warehousing.

A preview of Milwaukee Gas Light Company's 1957 advertising program, featuring full color ads and other innovations. TV ads were screened, and radio spots were auditioned.

In short, sight, sound, color, music, models, and drama were packaged to tell the gas sales opportunities in the Milwaukee market.

Climax of the Tuesday meeting was a cocktail party and dinner at the Milwaukee Athletic Club that featured Ralph T. McElvenny, president of the American Natural Gas Company, of which Milwaukee Gas Light is an affiliate, as the speaker.

McElvenny assured the audience that projects are going forward that will keep natural gas supplies abreast of the tremendously growing demand for natural gas in the system's markets. He also stressed the common purpose and need for unity between the utility and the manufacturer of natural gas burning equipment.

The meeting was followed up with individual sessions with the manufacturers at which specific plans were made for cooperation in an all-out attack on the Milwaukee market.

Skit portrayed hazards of selling gas appliances without local warehousing to permit rapid delivery.

Models add up total advertising impressions. Replica of gas company building was "built" from blocks representing various media.

Merchandising News

Gas Water Heaters & Dryers Up In First 9 Months

Factory shipments of automatic gas water heaters and dryers were both up for the first nine months of 1956 with 3.1 and 24 per cent respective increases over the first nine months of 1955.

Automatic gas water heaters registered a 3.1 per cent high with a record total of 2,203,100 compared with 2,136,100 units shipped during a similar period of 1955. Gas dryers showed the larger increase of 24 per cent with 285,548 compared with 230,632 units shipped during the first nine months of 1955.

'Home Companion' Joins Search for Top Homemaker

The American Gas Association announced today that the *Woman's Home Companion* will join AGA in its search for the country's top homemaker in the 1957 "Mrs. America" contest.

Servel Inc., and the Range Division of the Gas Appliance Manufacturers Association also will participate in the 1957 "Mrs. America" homemaking promotion. This marks the fourth consecutive year Servel will use the registered "Mrs. America" name in its national advertising and the third year that gas range manufacturers affiliated with GAMA will promote either "Mrs. America" ranges or employ the photograph and testimonial of the current "Mrs. America," Mrs. Cleo Maletis of Portland, Oregon, in their respective advertising campaigns.

Woman's Home Companion will have exclusive rights in the magazine field to the name and endorsement of "Mrs. America." First kick-off announcement of next year's contest will appear in the January issue of the magazine, along with a contest application blank. After January 20, application blanks will be available also at gas company offices.

Gas utilities, members of the American Gas Association, will conduct city, county, and state elimination contests for the fourth successive year in each of the 48 states and the District of Columbia. The 49 outstanding housewives and their husbands will be flown to Fort Lauderdale, Florida, where from May 7 through 14, 1957, the ladies will compete in the national grand finals to select a successor to the current "Mrs. America."

Aluminum-Tank Added To Hotstream Heater Line

The rust and stain proof qualities of aluminum as a tank material have been added to the line of Hotstream water heaters with the introduction of its new Model AL. Hotstream's line already includes stone lined, glass lined, and galvanized tanks and stone-lined range broilers.

The Model AL "Allumatic" gas automatic-storage water heater is available in 30 and 40-gal capacities.

Gas Vent Pamphlet Issued by GAMA

"Type B" gas vents—which can be used instead of masonry chimneys in homes that are going to be heated by gas—are the subject of a new pamphlet prepared by a group of vent pipe manufacturers.

Copies of the pamphlet may be obtained from Gas Appliance Manufacturers Association, 60 East 42nd Street, New York 17, New York.

Heavy Ad Campaign Launches New Water Heater Line

Mission Appliance Corporation has introduced its new line of Diamondglas gas water heaters with the most intensive and complete advertising program in the history of the firm.

Keynoting the market-by-market promotion of Diamondglas water heaters is the full-color dramatic "Worth a Fortune" billboard, offered local dealers on a co-op basis. In addition, dealers who feature the heaters receive a complete promotional package, centered on the same theme.

Concurrently with the market-by-market promotion, Mission will be running its year-round schedule of trade and consumer ads.

Members of the 1957 AGA Home Service Committee attending the recent Chicago meeting were: seated, left to right: Mildred R. Clark, Lucy Slagle, Irene Muntz, Marjorie Chandler, Mildred Endner, Mrs. Laura Piepgras, and Mrs. Eleanor V. Wiese. Standing, left to right: Ruth Soule, Marjorie Bettesworth, Evelyn Winkes, Betty Anne Morgan, Mildred Farrell, Jessie McQueen, Flora Dowler, Janet Lappin, Dorothy O'Meara, and Mrs. Constance J. Crawford.

Marjorie Chandler Heads AGA Home Service Committee

Marjorie T. Chandler, home service director of Consumers' Gas Company, Toronto, Canada, has been named chairman of the AGA's Home Service Committee.

Committee projects for 1957 include the annual Workshop February 4-6 at Toronto, with Consumer's Gas Company as host, and revision of "Home Calls," the Home Service training booklet.

The committee headed by Miss Chandler, includes Mildred R. Clark, Oklahoma Natural Gas Company; Lucy Slagle, Atlanta Gas Light Company; Irene Muntz, Rochester Gas & Electric Corporation; Mildred Endner, Minneapolis Gas Company, Mrs. Laura Piepgras, Central Electric & Gas Company; Mrs. Eleanor V. Wiese, Public Service Electric & Gas Company; Ruth Soule, The Brooklyn Union Gas Company; Marjorie Bettesworth, Consumers' Power Company.

Also, Evelyn Winkes, The East Ohio Gas Company; Betty Anne Morgan, Baltimore Gas & Electric Company; Mildred Farrell, Elizabethtown Consolidated Gas Company; Flora Dowler, The Manufacturers Light & Heat Company; Janet Lappin, Philadelphia Gas Works Division, UGI; Dorothy O'Meara, The Bridgeport (Connecticut) Gas Company; Mrs. Constance J. Crawford, North Shore Gas Company; Emagene Burge, United Gas Corporation; Julia Hunter, Lone Star Gas Company; Beatrice M. Millar, British Columbia Electric Company, Ltd.; and Jessie McQueen, AGA.

CALENDAR OF THE GAS UTILITY INDUSTRY

DECEMBER 1956

3- 4 Institute of Appliance Manufacturers, The Shoreham Hotel, Washington, D. C.

3-5 AGA-EEI electronics Seminar, Netherland-Hilton Hotel, Cincinnati, Ohio.

6-8 Interstate Oil Compact Commission, annual meeting, Fountainbleau Hotel, Miami Beach, Florida.

12 AGA Gas Industry Development Committee, headquarters, New York.

14 AGA board of directors meeting, headquarters, New York.

JANUARY 1957

17-24 National Housewares and Home Appliance Manufacturers Exhibit, Chicago, Illinois.

18 Oklahoma Utilities Association, accounting section.

20-24 National Association of Home Builders, Chicago, Illinois.

23 NEGA operating division, Hotel Statler, Boston, Massachusetts.

24 American Marketing Association, seminar on public utilities marketing, Dallas, Texas.

25 Pennsylvania Gas Association, mid-winter sales conference, Benjamin Franklin Hotel, Philadelphia, Pennsylvania.

28-29 Industrial Heating Equipment Association, Washington, D. C.

31-February 1 Southern California Meter Association, Sixth Annual Instrument Short Course, Los Angeles Junior College, Wilmington, California.

FEBRUARY 1957

3-5 Public Utility Buyers' Group, National Association of Purchasing Agents, The Brown Hotel, Louisville, Kentucky.

4-6 AGA Home Service Workshop, King Edward Hotel, Sheraton Hotel, Toronto, Ontario, Canada.

4-8 Western winter radio-television and appliance market, Western Merchandise Mart, San Francisco.

25-28 American Society of Heating and Air Conditioning Engineers, annual meeting and exposition, Chicago, Illinois.

MARCH 1957

11-14 National Electrical Manufacturers Association, Edgewater Beach, Chicago, Illinois.

11-15 National Association of Corrosion Engineers, Kiel Auditorium, St. Louis, Missouri.

21-22 NEGA, annual meeting, Hotel Statler, Boston, Massachusetts.

25-27 Mid-West Gas Association, Hotel Nicollet, Minneapolis, Minnesota.

25-27 AGA general management section, Edgewater Gulf Hotel, Edgewater Park, Mississippi.

28-29 Oklahoma Utilities Association, annual convention, Tulsa Hotel, Tulsa, Oklahoma.

APRIL 1957

2-4 University of Oklahoma Corrosion Control Short Course, Extension Study Center, Norman, Oklahoma.

8-10 National conference of electric and gas utility accountants, Sheraton-Park Hotel, Washington, D. C.

8-10 GAMA annual meeting, The Greenbrier, White Sulphur Springs, West Virginia.

8-11 AGA distribution, motor vehicles and corrosion conference, Rice Hotel, Houston, Texas.

14-17 American Home Laundry Manufacturers Association, annual convention, French Lick, Indiana.

16-18 AGA sales conference on industrial and commercial gas, Jung Hotel, New Orleans.

16-18 University of Oklahoma Gas Measurement Short Course, Norman, Oklahoma.

25-26 Indiana Gas Association, annual meeting, French Lick-Sheraton Hotel, French Lick, Indiana.

29-May 1 Southern Gas Association, New Orleans, Louisiana.

MAY 1957

6-7 AGA residential gas section, eastern sales conference, William Penn Hotel, Pittsburgh.

6- 8 Air Conditioning and Refrigeration Institute, The Homestead, Hot Springs, Virginia.

6-10 National Restaurant Association convention and exposition, Navy Pier, Chicago (AGA will exhibit).

7-9 AGA research & utilization conference, Cleveland, Ohio.

8-10 Joint AGA-PCGA gas supply, transmission and storage conference, Mark-Hopkins Hotel, San Francisco.

12-15 LPGA annual meeting, Conrad Hilton Hotel, Chicago.

19-22 Industrial Heating Equipment Association, Hot Springs, Virginia.

20-22 AGA mid-west regional gas sales conference, Edgewater Beach Hotel, Chicago.

20-22 AGA chemical, engineering and manufactured gas production conference, Balmoral Hotel, Bal Harbour, Florida.

20-24 National Fire Protection Association, Hotel Statler, Los Angeles.

21-22 AGA industrial and commercial gas section, managing committee, Sea Island, Georgia.

21-23 Pennsylvania Gas Association, annual meeting, Pocono Manor Inn, Pocono Manor, Pennsylvania.

PROFESSIONAL DIRECTORY

Engineers, Designers and Manufacturers of
LP-GAS STAND-BY PLANTS
and special equipment for every requirement

AMERICAN LIQUID GAS CORPORATION
1109 Santa Fe Avenue • Los Angeles 21, California

Sell to the Gas Industry Consistently, Economically
with American Gas Journal
Professional Directory Advertising
Write Box 1589, Dallas, Texas for rates

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PROPANE PLANTS *Design · Engineering · Construction*
DRAKE & TOWNSEND INC. 11 WEST 42ND STREET NEW YORK 36, N. Y.

RICHARD W. STAFFORD
CONSULTING GAS ENGINEER
2944 Grant Street, Evanston, Illinois
Phone UNiversity 4-6190
DESIGN • CONSTRUCTION • INVESTIGATION SURVEYS
R. W. STAFFORD — Evanston, Illinois
MARSHALL G. COOK — Evanston, Illinois
ARNOLD C. RATHKEY — 310 Kenilworth Road, Waterloo, Iowa

Accuracy

THAT BEHAVES AS IT SHOULD

Tomorrow's profits rest in the hands of the gas meters you buy today. That's the "credo" of Superior design and manufacture . . . to profit for you in three ways:

First . . . through unfailing accuracy, to protect public confidence in your services . . . at the same time protecting those services by preventing losses in the revenue needed to maintain them.

Second . . . to reduce repair costs. Superior concentrates on the little details that keep vital parts working years longer without replacement . . . details that save valuable minutes in the shop . . . details that help you get Superior meters OK'd and back on the job without fuss or delay.

And third . . . to protect you from premature obsolescence . . . by building meters that last longer . . . and by a firm policy of always making repair parts available for Superior meters . . . no matter how old.

What more could you ask of a quality meter? Ask it all of Superior . . . with confidence . . . next time you buy.

Send for Bulletin No. 1100

superior
GAS METERS

SUPERIOR METER COMPANY, INC.

19 West 50th St., New York 20, N. Y.

A SUBSIDIARY OF NEPTUNE METER COMPANY

SALES OFFICES: Atlanta, Boston, Chicago, Dallas, Denver, Los Angeles, Louisville, No. Kansas City, Philadelphia, Portland, Ore., San Francisco (Millbrae)

SU-3

Gas Heated Water Warms Sidewalk. New York architects Voorhees, Walker, Foley & Smith designed this snow melting system which the Cincinnati "Times-Star" reports provides, "the largest heated sidewalk in Cincinnati." A gas fired boiler within the Procter & Gamble Company building heats a water and anti-freeze solution which is circulated throughout the corrosion resistant piping.

The pipe grids installed beneath a concrete sidewalk around two sides of the Procter & Gamble office building, consist of more than 12,000 ft of wrought iron pipe in 1, 1¼ and 2-in. diameters. When snow starts to fall, the heated water and ethylene glycol solution is pumped throughout the system. Sidewalk extends 283 ft down Sixth Street and 148 ft down Sycamore Street in Cincinnati.

Gas Industry to Sponsor TV 'Playhouse 90'

Gas utility companies throughout the U. S. will make their network television debut Thursday, January 10, as sponsors of CBS television's distinguished new 90-minute dramatic series, "Playhouse 90."

It will be the American Gas Association's first use of TV networks as an advertising medium.

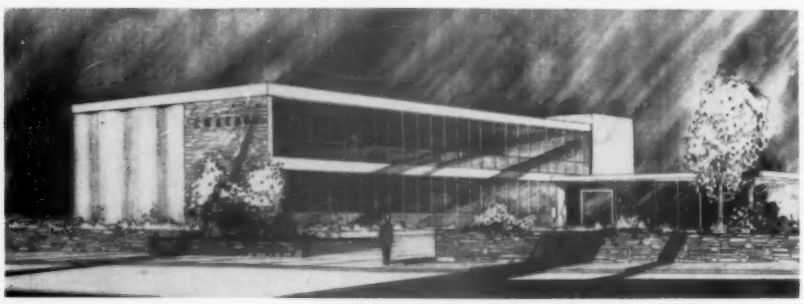
The gas utility companies, transmission companies, manufacturers, equipment suppliers, and producers represented by AGA will sponsor, on alternate Thursdays, the last half-hour portion of "Playhouse 90" on more than 125 TV stations across the nation.

Julia Mead will be the industry's hostess and in addition to presenting commercial messages, she will also make appearances at gas industry gatherings throughout the country. She is already well known to network audiences through her regular appearances on other top-rated television programs.

"Playhouse 90" is the first hour-and-a-half drama series ever to be presented by a television network on a regular weekly basis.

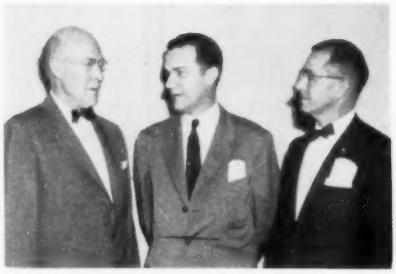
1957 A/C Plans Discussed At SGA Round-Table Meeting

More than 56 delegates from 19 companies attended the Southern Gas Association's Western Area Gas Air Conditioning round-table conference held in Tulsa recently. The conference had two sponsors: Ira W. Wilke, Southern Union Gas Company, and Merle Orelup, Oklahoma Natural Gas Company.



Cascade To Settle In Seattle Offices

Cascade Natural Gas Corporation plans to build an administration headquarters building in Seattle, Washington. The two-story, reinforced concrete struction will house administration, engineering, sales, accounting, and purchasing divisions of the company, and has been designed to give maximum efficiency to centralized operations of the utility. The building which will have 11,000 sq ft on two floors, is designed for the possible future addition of two more floors. Also included will be a daylight basement that will provide an additional 5000 sq ft for mechanical equipment, gas heating facilities, a fireproof storage vault, and additional office space as needed.



E. J. Boothby (left), president of the Washington Gas Light Company, Washington, D. C., is the new chairman of the board of trustees of the Institute of Gas Technology. With Boothby are Dr. J. T. Rettaliata (center), president of Illinois Institute of Technology and of IGT, and Dr. Martin A. Elliott, director of IGT.

IGT Re-elects Nine; Names Two New Members

Nine members were re-elected and two new members named to the board of trustees during the fifteenth annual meeting of the Institute of Gas Technology of Illinois Institute of Technology.

E. J. Boothby, president, Washington Gas Light Company, Washington, D. C., was elected chairman of the board of trustees.

Re-elected to three-year terms on the board of trustees were: Frank H. Adams, president, Surface Combustion Corporation; Walter C. Beckjord, president, Cincinnati Gas & Electric Company; Alexander M. Beebee, president, Rochester Gas & Electric Corporation, and Thomas Drever, chairman of the board, American Steel Foundries, Chicago.

Also: N. Henry Gellert, of Gellert, Griffin, Harrigan & Associates; R. M. Heskett, president, Montana-Dakota Utilities Company; N. C. McGowen, president, United Gas Pipe Line Company; Frank C. Smith, president of the Houston Natural Gas Corporation; and Harry K. Wrench, president, Minneapolis Gas Company.

J. Theodore Wolfe, executive vice president, Baltimore Gas & Electric Company, was elected to complete an unexpired term ending in 1957. Marvin Chandler, president, Northern Illinois Gas Company, was elected to fill an unexpired term ending in 1958.

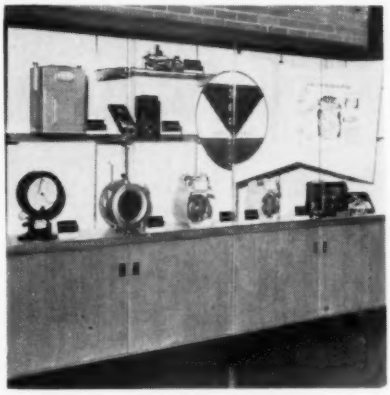
The officers of IGT are: Dr. John T. Rettaliata, president; Raymond J. Spaeth, secretary-treasurer, and Dr. Martin A. Elliott, director.

Regional Workshops See Gas Industry PR Gains

Gas industry management is increasing its use of advanced public relations practices and techniques, was the consensus of 90 gas company delegates attending regional public relations workshops in Coronado, California, and New Orleans, Louisiana. The meetings were sponsored by American Gas Association in cooperation with Pacific Coast Gas Association and Southern Gas Association respectively.

Frank C. Sullivan and Fred A. McCanlies, both of Southern California Gas, served as chairman and program chairman of the Coronado workshop.

Kenneth Fellows, Houston Natural, was chairman of the New Orleans conference.



A complete exhibit of gas measuring equipment (above) has been designed and installed at the Institute of Gas Technology in Chicago by American Meter Company as a part in its continuing program to foster student interest in the rapidly expanding gas industry.

Fleet Safety Contest Flags 14 Per Cent Gain

Gas industry companies reduced their motor transportation accident rate 14 per cent during the past year. American Gas Association announced 15 awards won by the industry in the twenty-fifth annual National Fleet Safety Contest conducted by the National Safety Council. The reduction was one of the best achievements in the contest's truck division, which had an accident rate 26 per cent higher than for the previous 12 months.

An accident frequency rate of only 1.58 per 100,000 miles of operation was credited to the gas industry contestants with total operations of 291,000,000 miles between July, 1955, and June, 1956. The rate for 1954-55 was 1.84.

Award winners in the gas industry division competition were:

GAS UTILITY (very large group) — Columbia Gas System, Inc. (Pittsburgh group); Columbia Gas System, Inc. (Columbus group); and Milwaukee Gas Light Company.

GAS UTILITY (large group) — Pioneer Natural Gas Company, Kentucky West Virginia Gas Company; and Houston Natural Gas Company.

GAS UTILITY (medium group) — Wisconsin Power and Light Company; Godfrey L. Cabot, Inc. Appalachian division; and gas division — Water Gas and Sewage Treatment Department, Duluth, Minnesota.

GAS UTILITY (small group) — Concord Natural Gas Corporation; Elizabeth & Suburban Gas Company; and the River Gas Company.

Smoking Is Source Of More Fires Than Gas

Careless smokers cause seven times as many building fires as gas and gas appliances, the American Gas Association reported recently. 1955 figures resulted in gas dropping from fourteenth to sixteenth in the National Fire Protection Association's list of 24 building fire causes, despite an 8.9 per cent increase in gas consumption. Listed far below any other fuel, including electricity, used in home, business, and industry, only two per cent of the nation's building fires and losses in 1955 were attributed to gas.

Reynolds OFFERS A NEW PERFECTED SAFETY CONTROL FOR ALL SERVICE REGULATORS

Reynolds' new Safety Control may be attached to any Reynolds spring type service regulator built in the last fifteen years.

GAS CONTROL SINCE 1892

* **Prevent regulator from falling in a wide open position, thus limiting the amount of gas the safety seal has to pass.**
* **Enable the gas company to set the regulator for a certain demand and if a customer increases that, his outlet pressure would drop which would cause him to call the company and they can find out what his real demands are.**

REYNOLDS GAS REGULATOR CO.
ANDERSON, INDIANA

Business Insurance

Gas brings you carefree homemaking
AUTOMATIC, DEPENDABLE, CLEAN, FAST, SILENT,
GAS is 7 ways better for the 7 big household services
Gas gives you more comfort and convenience
Gas cooks meals... heats your home... preserves food... dries clothes... cools your home... heats water... incinerates refuse...

Millions of National Advertising Messages Like These Are Selling Gas for the 7 Big Household Services

for You...TODAY AND TOMORROW

To help sell more gas to today's and tomorrow's home owners, 13 manufacturers supplying equipment to the gas industry are investing in national advertisements like these in The Saturday Evening Post, New Homes Guide and Home Modernizing.

EVERY GAS UTILITY CAN TIE-IN AND BENEFIT

Gas Utilities are making this program pay extra dividends by:

1. Publishing these advertisements in local newspapers. More than 1,200 free ad mats, used by gas utilities and LP-Gas dealers, have added 21,000,000 messages to the GEM Program.
2. Using FREE enlargements (30" x 40") of these advertisements as floor and window displays.
3. Mailing FREE proofs of the advertisements to dealers. More than 20,000 reprints have been distributed.
4. Using appliance price tags, similar to tags shown in advertisements, and supplying these price tags to dealers. Approximately 50,000 tags have been distributed at $10 per thousand.

ALL SUPPLIERS ARE INVITED TO PARTICIPATE

As the gas industry goes, so will go the sales of every manufacturer selling to it. The GEM Program is producing results for the industry and for its sponsors. All suppliers are invited to participate. For further information, write for the booklet, "The GEM Program...Business Insurance For You And Your Customers." Available from Gas Equipment Manufacturers Committee, c/o Gas Appliance Manufacturers Association, 60 East 42nd St., New York 17, New York.

AMERICAN METER CO. MEASUREMENT ENGINEERS

AMERICAN METER COMPANY

INCORPORATED ESTABLISHED 1836

Published as a service to the Gas Industry

GAS is 7 ways better for the 7 big household services

Gas
MAKES YOUR HOME MODERN AS TOMORROW...
1,000,000 MORE HOMES EACH YEAR CHOOSE
Gas
Gas IS MODERN, CLEAN, FAST, DELIVERY DEPENDABLE, AUTOMATIC and SAFE
Gas IS MORE ECONOMICAL, TOO...
Gas GIVES YOU MORE FREE TIME...
Gas GIVES YOU MORE COMFORT AND CONVENIENCE...

Sponsors of the GEM Program

American Cast Iron Pipe Co.
American Meter Co.
Cleveland Trencher Co.
Fisher Governor Co.
E. F. Griffiths Co.
A. C. Lawrence Leather Co.
Mueller Co.
Rockwell Manufacturing Co.
M. B. Skinner Co.
Sprague Meter Co.
Superior Meter Co.
Subsidiary of Neptune Meter Co.
U. S. Pipe and Foundry Co.
Vulcan Rubber Products
Division of Reeves Brothers, Inc.

WHAT WILL YOUR PIPE LINES LOOK LIKE 10 YEARS FROM NOW ?

In case after case, lines protected with TAPECOAT have been dug up after more than 10 years of service *with no signs of deterioration on the pipe surfaces uncovered.* That's why TAPECOAT coal tar coating is specified by those who realize that continuing protection is the *first* consideration.

Since 1941, this quality coal tar coating in handy tape form has demonstrated its ability to withstand corrosion year after year, above and below ground, on pipe, pipe joints, couplings and other vulnerable surfaces.

Why gamble with "unknown" protection? By using TAPECOAT, you'll be sure to have the quality protection you need for long service life without costly maintenance and replacement.

Write for brochure and prices

The TAPECOAT® *Company*

Originators of Coal Tar Coating in Tape Form

1567 Lyons Street
Evanston, Illinois

Men At Work

IN THE GAS UTILITY INDUSTRY

H. D. Hancock

K. E. Crenshaw

● **Harry D. Hancock** has been elected president of Cities Service Gas Company. Hancock succeeds **Glenn W. Clark,** who recently resigned to accept the presidency of Mississippi River Fuel Corporation. The board of directors of Cities Service created the new post of executive vice president, to which **Kirby E. Crenshaw** was elected.

● **Thomas Z. Dunn,** former assistant manager, has been promoted to manager of commercial sales for the Ohio Fuel Gas Company.

● **Harold E. Wise,** former head football coach and associate professor at Ohio University, has joined the Ohio Fuel Gas Company in Columbus as director of training.

● **Arthur R. Cox** was elected vice president and treasurer of the San Diego Gas & Electric Company. He succeeds **J. M. Bourus,** who is retiring. **C. W. De Voe** will succeed Cox as comptroller.

● **James C. Stopford** has been named executive vice president and general manager of the Honolulu Gas Company succeeding the late A. Eugene Englebright.

● **Carl R. Lawrence** has been elected vice president of the Atlanta Gas Light Company. Former general superintendent of the Atlanta operating department of the company, he will continue to devote most of his time to that activity.

C. R. Lawrence

V. S. Fortunato

● **Vincent S. Fortunato** has been appointed assistant manager of the commercial sales department of The Peoples Gas Light and Coke Company.

● **B. E. Harrell** has been named manager of the newly created department of gas supply and gas sales for Arkansas Louisiana Gas Company.

● **C. Spencer Clark** has been named president of Cascade Natural Gas Corporation following the resignation of **Stewart Matthews.** Resigning because of extended illness, Matthews will remain as a member of the board of directors and serve in a consulting capacity.

C. S. Clark

C. M. Sturkey

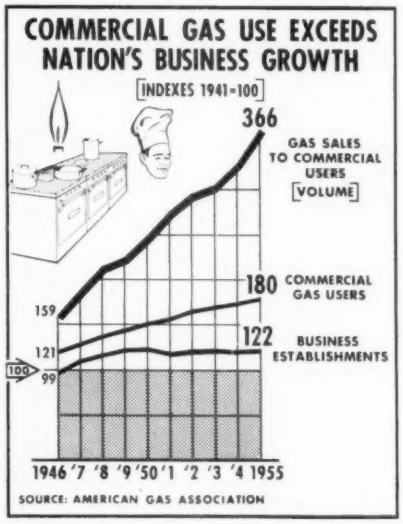
● **Charles M. Sturkey** has been elected president of Washington Natural Gas Company. Sturkey, former executive vice president and general manager, succeeds the late **Walter S. Byrne.** Three other members of the company were promoted: **Bernard T. Poor,** former vice president and manager of the company's southern division, was elected executive vice president and general manager to fill the post vacated by Sturkey. **Leland E. Jones,** former assistant treasurer and northern division manager, was elected vice president and southern division manager, and **James F. Gary** was elected vice president in charge of operations.

● Laclede Gas Company has announced three personnel changes: **Lee Liberman,** former assistant superintendent of the distribution department, has been appointed assistant to the operating vice president; **J. D. Killoren,** internal auditing manager, retired after nearly 50 years of service. Succeeding Killoren as internal auditor will be **Allen H. Lynch,** former assistant manager of the department. **Clarke M. Rainey,** has been appointed head of the general accounting department where he has been assistant manager since May of last year.

Walter S. Byrne

Walter S. Byrne, 67, president of Seattle Gas and Washington Natural Gas Companies since March, 1955, and a nationally known gas utility company figure, died recently.

TRADE NEWS OF THE GAS UTILITY INDUSTRY



Commercial gas customers in the United States are growing at a faster rate than retail business establishments. Volume of commercial gas sales has more than tripled since 1941. Americans spend more than $15 billion per year on meals consumed outside the home, and nine out of 10 of these meals are cooked with gas.

The OLD... and the NEW

New Trademark Designed For White-Rodgers

White-Rodgers Company, manufacturers of temperature controls, is currently unveiling a "new look" in trademarks designed for them by Raymond Loewy Associates.

The new trademark portrays the function of White-Rodgers products — temperature control for modern comfort. The circle represents the dial, and the triangle, the dial indicator. The basic design has been planned to permit "switches" in color, so the trademark will harmonize with layout and color distribution in the various White-Rodgers product emblems, advertisements, and display materials.

White-Rodgers new *Fashion* Thermostat, will be one of the first of the company's products to display the new trademark.

Magic Chef Rearranges Manufacturing Facilities

Plans for rearrangement of the manufacturing facilities of Magic Chef, Inc., have been announced. Production of cooking and heating appliances will be concentrated in Magic Chef plants in Cleveland, Ohio, and Franklin, Tennessee. This will consolidate manufacturing activities in three of the four Magic Chef plants.

The expansion of production in the Cleveland and Franklin plants will begin with manufacture of the company's 1957 line, which will be shown at the Chicago Furniture Market in January.

During the past six months, Magic Chef has reorganized its national parts and service department and this division will continue to operate from its present quarters in St. Louis.

NEWS NOTES

Ruud Manufacturing Company has expanded its gas water heater marketing activities in southern Florida by naming W. R. Seith as its factory sales representative in that area. Seith will cover southern Florida from headquarters in Fort Lauderdale.

New and larger facilities in the Seattle district have been announced by General Controls Company to service its customers with its line of residential, industrial, and aircraft controls. William R. Nason is in charge of the new General Controls offices and warehouse.

Also new and larger facilities in the St. Louis Branch territory have been announced. The new St. Louis building will afford larger warehouse facilities for servicing General Controls customers in that area.

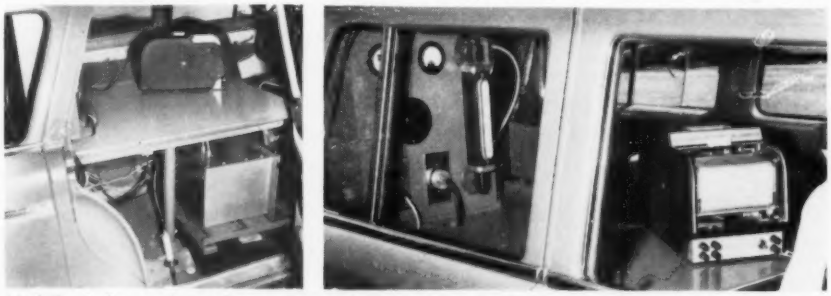
Robertshaw-Fulton Controls Company has established a national organization to provide extensive field service for appliance manufacturers using its various control devices. The new organization will set up independent control reconditioning facilities in key market locations throughout the United States. These reconditioning units will be operated by independent firms, but will be staffed with factory-trained personnel and use factory parts.

The Kendall Company launched construction of their new 35,000 sq ft, $1,300,000 plant in Franklin, Kentucky, recently. This plant will produce Polyken industrial tapes, plastic film, and plastic specialties. The two-story plant will triple the company's capacity for these products, which are now being made in Chicago.

W. M. Connor

Earl Hudson

Three plant managers of Rockwell Manufacturing Company's meter and valve division have been promoted. They are: W. M. Connor, general manager of the Du Bois gas meter plant, has moved to Pittsburgh as assistant to the vice president; Earl Hudson, who was named general manager of the Porterville, California, plant in January, 1956, succeeds Connor at Du Bois; A. A. Fomilyant, general manager of the Tulsa, Oklahoma, plant, will assume the general managership of the Porterville plant when it is completed early next year.



Mobile infra-red analyzer for detecting gas leaks is now in service for Heath Survey Consultants, Inc. The unit supplements Heath's current leakage control procedures. Escaping gas is picked up by a tube which protrudes below the car. Any gas sample picked up passes through dust filters and continues on to the infra-red analyzer, which indicates presence or absence of methane. Results are recorded on strip chart providing permanent record of leak locations.

THOUSANDS OF MILES OF LONE STAR LINE PIPE

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Lone Star electric weld line pipe has uniform wall thickness in every joint. Quick, accurate field-joint line-up and outstanding weldability . . . plus easy-to-bend characteristics . . . mean faster construction schedules. Plus value: year-after-year of trouble-free service.

Lone Star API line pipe, casing and tubing . . . made in Lone Star's ultra-modern plant . . . are quality-controlled from mining of the ore through the fine, finished products in the pipe mills. Lone Star is a completely integrated operation . . . dedicated to serving the oil and gas industries.

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Trade Personals

● **B. G. Bowden** has been appointed director of styling and industrial design for the John Wood Company.

B. G. Bowden

Frank Coyle

● **Frank Coyle** has been appointed manager-builder sales of Norge Division, Borg-Warner Corporation. He succeeds **Joseph P. Halpin,** who was named general manager of the Borg-Warner Corporation's builder sales division.

● **R. J. Nevins** has been appointed eastern division manager of the Florence Stove Company. His sales area will include Delaware, Maryland, New Jersey, New York, Pennsylvania, Virginia, and West Virginia.

● **William C. Bolenius** and **Clyde E. Weed** have been elected directors and **Robert T. Stevens** re-elected director of the Guaranty Trust Company of New York.

● **Ralph A. Purcelli** has been named general manager of the new Rockwell Manufacturing Company plant at Statesboro, Georgia. He was a former assistant general manager of Rockwell's gas regulator plant at Norwalk Ohio.

Ralph Purcelli

M. P. Stillinger

● **Morris P. (Morry) Stillinger** has joined the General Controls Company as a sales engineer in the Los Angeles territory. He will specialize in servicing original equipment manufacturers with General Controls' automatic controls for residential, industrial, and aircraft use.

● **Everett A. Andes** has been appointed advertising manager of The Girdler Company and Tube Turns.

James Kniveton

James Kniveton, vice president engineering, Selas Corporation of America, died November 12, after a short illness.

NEW LITERATURE

FOR THE GAS UTILITY INDUSTRY

"Outdoor" Control Chart. A chart scheduling the most suitable "Outdoor" controls for use with different types of heating systems under varying conditions and requirements has been prepared by Automatic Devices Company. Accompanying this chart are "guide specifications" prepared in outline form and scheduled separately for various types of heating systems.

Bulletin No. N-756, Automatic Devices Company, Inc., 714 Hillgrove Avenue, Western Springs, Illinois.

Globe Valves Circular. A new, four-page, detailed circular on the two pressure classes of Lunkenheimer LQ600 bronze globe valves, for a wide variety of services is now available. Circular lists all features of each LQ600 pressure class, and describes and includes the ASTM, ASME, and military specification numbers of the exclusively-developed Lunkenheimer alloy used for the bodies and bonnets.

Circular No. 602-2, Lunkenheimer Company, Box 360, Cincinnati 14, Ohio.

"Tape It Easy." Techniques for protecting underground pipe from corrosion with "Scotchrap" brand pipe insulation tape are described in a new how-to-do-it booklet by Minnesota Mining and Manufacturing Company. The new 24-page booklet provides step-by-step photographs and instructions for wrapping bends, elbows and short sections; patching pipe with tape; preparing joint surfaces for wrapping; wrapping welded joints and taping straight pipe sections as well as street "T" fixtures and other typical fittings. Coverage table on the book's back cover lists recommended tape width for various pipe sizes, outlining the minimum recommended tape overlap and the number of squares of tape needed per 100 ft of pipe using various overlaps.

Department D6-262, Minnesota Mining and Manufacturing Company, 900 Fauquier Street, St. Paul 6, Minnesota.

Novent Heater Sales Package. A special sales promotion package on Hunt Heater Corporation's new line is now available to gas utility company sales managers. Contents include samples of mail pieces, information on displays, and order forms for radio spot scripts, TV films, decals, and other items.

Hunt Heater Corporation, 220 North 12th Avenue, Nashville, Tennessee.

New Gas Oven Control. A bulletin describing the "Oventrol" gas oven control is available from the manufacturer, Robertshaw-Fulton. The control, model BJ-C, is a combination gas cock and oven thermostat with an integral automatic shutoff valve. The valve is actuated by a combination pilot burner and thermocouple, and provides 100 per cent shutoff if the pilot flame should be extinguished. Cutaway view and diagrams that show parts and dimensions, installation details and useful information are included.

Bulletin RT-781, Robertshaw-Fulton Controls Company, 110 East Otterman Street, Greensburg, Pennsylvania.

Service Cocks. A complete line of service cocks, meter and air cocks for moderate-pressure services, such as gas, water, and utility, is described in a new 12-page bulletin issued by Rockwell. Principal emphasis is given to the Rockwell "1092" tamper-proof service cock specially designed to eliminate the menace of tampering where a curb installation is involved — or an installation beside the meter or at some other exposed location.

Bulletin V-605, Meter and Valve Division, Rockwell Manufacturing Company, 400 North Lexington Avenue, Pittsburgh 8, Pennsylvania.

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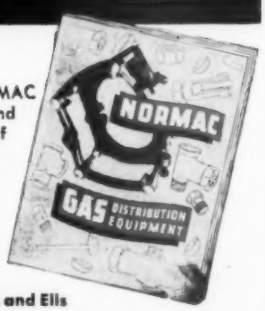

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NEW EQUIPMENT

FOR THE GAS UTILITY INDUSTRY

Pipe Pusher One Man Operation. The Pow-r Mole, a compact new device for pushing in water and gas lines and pulling copper or lead lines up to 3-in. in diameter under roads, streets, sidewalks, lawns, or wherever it's better not to dig up the surface has been developed by Pow-r Devices. It replaces the bucket on any standard tractor-mounted hydraulic backhoe using the two bucket mounting pins. One man can dig the trenches, attack the unit, insert the pipe sections and operate the tractor hydraulics. Since the Pow-r Mole utilizes the power of the tractor to push or pull pipe, and down pressure on the backhoe boom stabilizes the unit while in operation, no other equipment such as air compressors, jack hammers, or winches is needed.

Pow-r Devices, Inc., Department 127, Clarence Center Road, Clarence Center, New York.

Dry Type Air Filter. A dry type, renewable media air filter has brought about the development of the new MULTI-Pak air filter by American Air Filter Company, Inc. The MULTI-Pak is a dry type air filter for applications requiring air filters of standard construction but needing higher-than-normal cleaning efficiencies. Its effectiveness can be regulated by a variety of media, ranging from inexpensive cellulose fiber sheets, through dense, highly effective glass fiber mats. The variety of thicknesses, densities, and textures make it possible to obtain any desired efficiency in dust and smoke removal from plant pollen to tobacco smoke, even at extremely high temperatures and with minimum operating costs.

American Air Filter Company, Inc., 215 Central Avenue, Louisville 8, Kentucky.

New Welded Steelcase Meters. Four new meters of advance design will be introduced by American Meter Company as a further development of the American W-60 welded steelcase gas meter introduced two years ago. The new models, W-175, W-210, W-250, and W-300, are rated with 0.64 Sp Gr gas at ½-in. pressure drop and 5 psi rated working pressure.

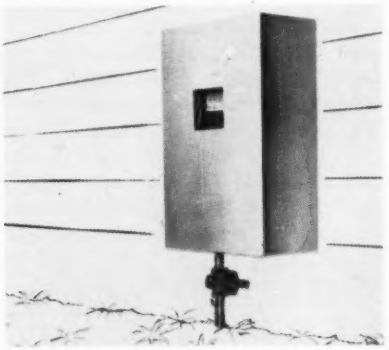
The welded steelcase meters combine all of the design features employed in American displacement meters and present a completely new approach to meter maintenance and retirement. Because of welded steelcase construction, the new meters are lighter than "hard-case" types but are comparable in application. The new meters feature external index box isolated from meter pressure with a gas-tight, frictionless rubber-grommet index shaft seal; removable handhole for easy access to tangent; molded Duramic diaphragms, and reinforced flag rods for trouble-free service for the meter.

American Meter Company, 60 East 42nd Street, New York, New York.

Heavy Duty Safety Bar. Engineers Tool Company has announced a heavy duty Impaction safety bar, with built-in safety design. Cutting edge of chisel is 1¼-in. wide. Forge hardened for rough use. Operator places chisel where he wants to make penetration. Reciprocating motion of weighted handle drives the cutting edge with minimum effort — maximum safety. Weighs 18 lb. For use when probing through thick concrete, or asphalt; rough, frozen ground or breaking up thick ice.

Engineers Tool Company, 116 West Main Street, Lake City, Iowa.

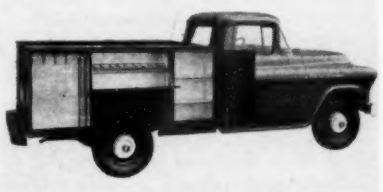
Adjustable Metal Gas Meter Housing to hide outdoor gas meters has just been introduced by the Bel Echo Metal Products Company of Quincy, Illinois. Available in two sizes: 16 by 12 by 29½-in. and 18 by 12 by 29½-in., the housing will fit most standard size gas meters. The new product can be painted to match the color of the house, thereby hiding gas meters completely and preventing any possibility of tampering. A glass window allows easy reading of the meter. The meter housing can be mounted directly to the meter or bolted to the house.



Bel Echo Meter Products Company, Quincy, Illinois.

Utility Truck Body. Utility Body Company has added a new Model UB to their extensive line of service and construction bodies. Low in cost, the new service body incorporates many special features including: roomy 15-in. compartments with shelves and trays to hold tools; a full four-foot wide bed with a heavy-duty plate floor; double panel doors hinged to the body on free-moving bearings; flush, pull-out type door handles with slam-action catches and master-keyed cylinder locks. Rolled edges on all parts are a safety feature.

Utility Body Company, 1530 Wood Street, Oakland, California.



Gas Leak Probe. Prospecting for gas leaks on either high pressure or low pressure lines is now twice as easy, twice as fast. "M-pact-O" developed by Engineers Tool Company, has a short probe which penetrates 36 in. then the long probe takes over and goes down 72 in. No hammering with a heavy sledge is necessary as reciprocating motion of the weighted handle operates it.

Engineers Tool Company, 116-118 West Main Street, Lake City, Iowa.

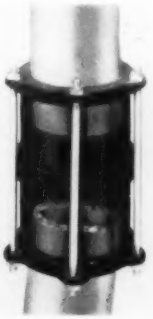
Regulators. A new regulator that will withstand momentary overloads as high as 1000 psi on the outlet side has been introduced by Rockwell. Designed primarily to provide extra safety for rural gas services, particularly where the gas is piped directly to rural homes from high-pressure pipe lines, the new "141" regulator offers the highest capacity in its size range. Four interchangeable orifices and five interchangeable springs enable the regulator to operate on pressures ranging from 3 psi to 400 psi. Regulator features: Increased diaphragm surface area; absolute lock-up at zero flow; and a protective cap guarding the spring adjustment screw from damage such as bending and breaking and thus making it possible to bury the regulator underground and pipe the vent above ground.

Meter and Valve Division, Rockwell Manufacturing Company, 400 North Lexington Avenue, Pittsburgh 8, Pennsylvania.

Chain Wrench. A new line of chain wrenches has been announced by The Toledo Pipe Threading Machine Company. Designed for rugged use and long life, the new wrenches are useful for close corner work on pipe sizes up to 6-in. Available in two models, ½ to 4-in. and 3 to 6-in.

Toledo Pipe Threading Machine Company, Toledo, Ohio.

Break Coupling. Smith-Blair has announced an improved coupling for repairing misalignment breaks in water, gas, or oil pipe lines. Called the Series 4K Flexible Cut-In Coupling, it is applicable to cast iron, asbestos-cement or steel pipe and is installed with the pipe in place. This cut-in coupling acts as a double coupling replacing twice the length of pipe cut out. The pipe is repaired quickly, as well as given additional flexibility, simply by cutting out any break, broken flange, bell or pipe coupling and using the cut-in coupling. Unique feature of this design is a dual sleeve plus a centering ring. When break in the pipe is cut out sufficiently for one sleeve to be placed, all the parts of the cut-in coupling are then assembled to repair-connect the pipe while in place. Pipe can be out of alignment over 6 deg and be repair-connected in place. Sizes from 2 to 12-in. are now in production.



Smith-Blair Factory, 535 Railroad Avenue, South San Francisco, California.

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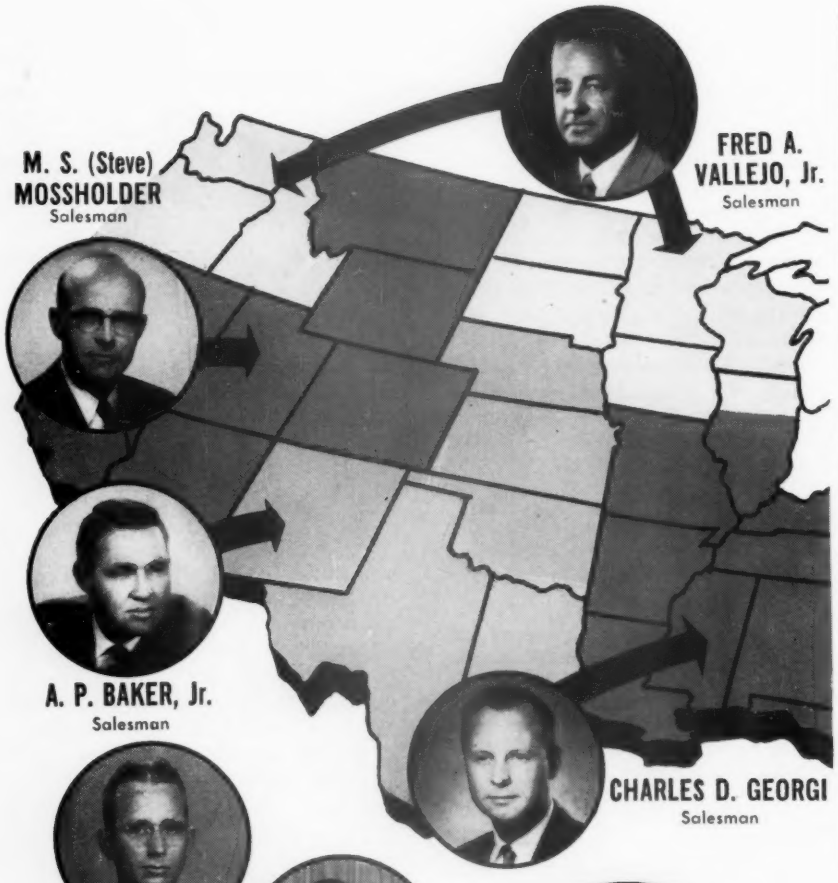

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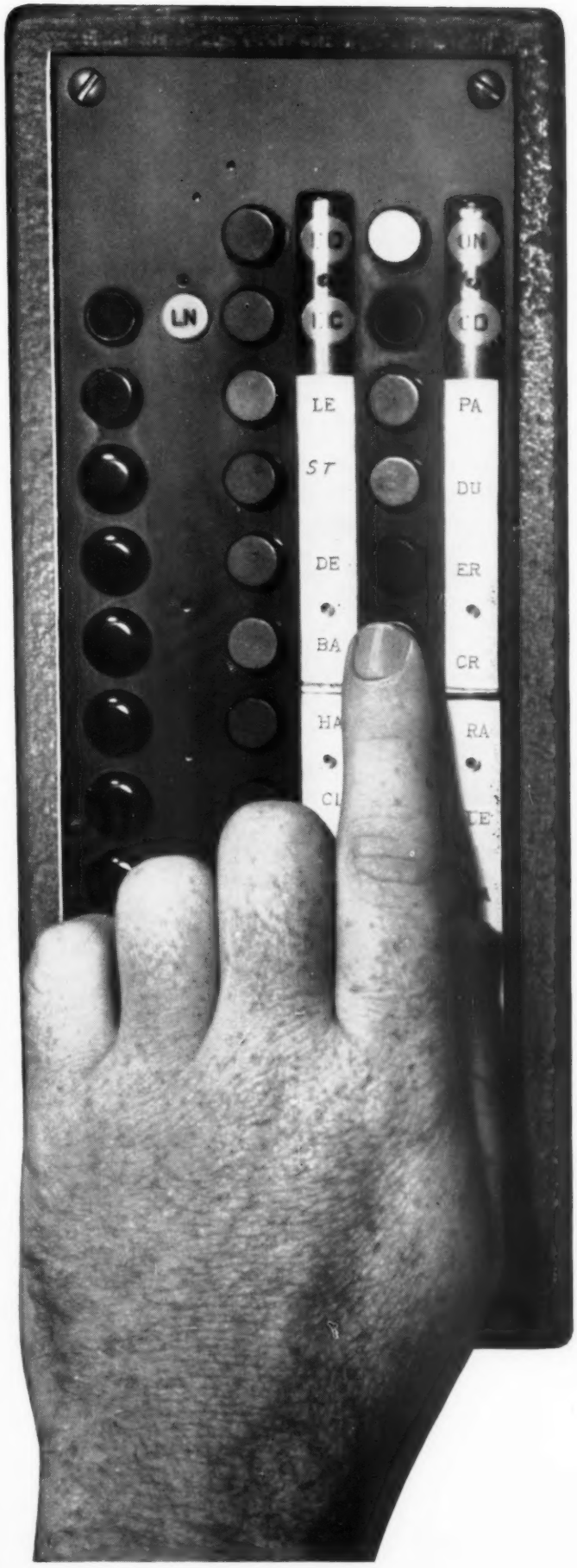

Push-button selector speeds coded data in Gulf Interstate's telemetering system

You are looking at a special push-button private line teletypewriter device developed by the Bell System and used by Gulf Interstate Gas Co.

The company uses the teletypewriter as a recorder in its digital telemetering system, which provides automatic transmission of operating data. Such data includes engine speeds as well as suction and discharge pressures at five remote compressor stations.

The dispatcher in the company's Houston headquarters simply pushes the proper buttons. The selected distant station is instantly on the circuit. Coded telemetered data is then received directly on the teletypewriter in the form of an accurate, easily read record.

This unique selector unit is another example of how equipment developed by the Bell System meets communication needs.

The Bell System welcomes the opportunity to work with you in a study of your special communication requirements. There's no obligation.

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